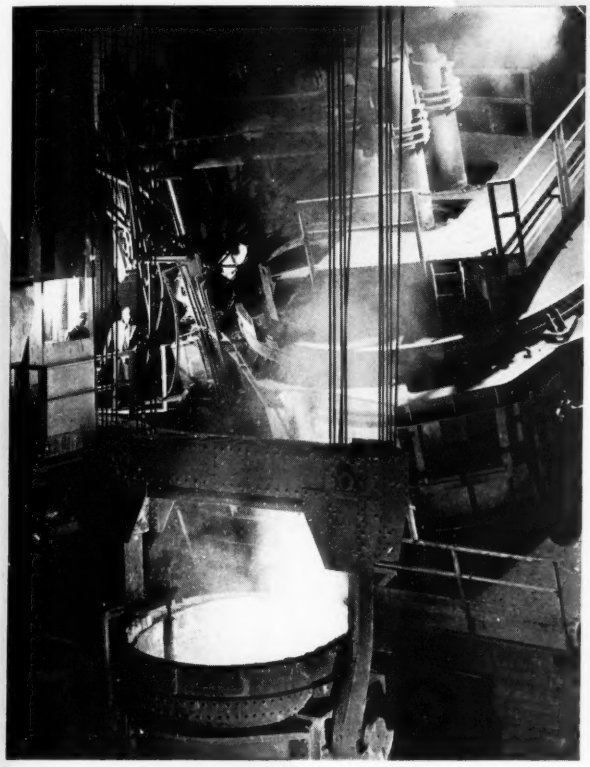
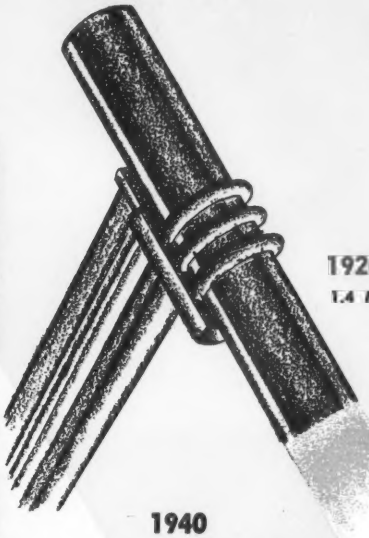
JULY 30, 1951

STEEL

THE WEEKLY MAGAZINE OF METALWORKING





1920
1.4 MILLION TONS

1940
1.9 MILLION TONS

1950
6.9 MILLION TONS

1953
9.9 MILLION TONS

ARC STEEL CAPACITY

From start of World War II to 1953 expected to soar **393%**

—see page 74

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give "Mr. Tubes" a closer look at these ORDER DATA to get: improved service and material economy

Carbon, Alloy and Stainless steel tubes are defined under CMP regulations as "controlled materials". As such, they are critical materials. Not being a mind reader, "Mr. Tubes"—your B&W Tube Company representative—needs a *close* look at the following facts in order to supply the available tubing most economically suited to your requirements.

1 All related CMP authorizations and government contract numbers.

2 Any acceptable alternates in type, finish, composition, and size.

3 A brief, informative description of your intended fabricating methods.

4 A description of the end-use, exact as to product and its service.

THE BABCOCK & WILCOX TUBE COMPANY

Executive Offices: Beaver Falls, Pa.

General Offices and Plants

Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill.
Cleveland 14, Ohio • Denver 1, Colo. • Detroit 26, Mich.
Houston 2, Texas • Los Angeles 15, Calif. • New York 16, N. Y.
Philadelphia 2, Pa. • St. Louis 1, Mo. • San Francisco 3, Calif.
Syracuse 2, N. Y. • Toronto, Ontario • Tulsa 3, Okla.

B&W SEAMLESS and WELDED TUBES

TA-1640-C

FIRST OF ALL THEY'VE GOT TO BE *Strong!*

When purchasing circular steel blanks, what's your number one requirement? Strength, isn't it? First of all, they've got to be strong!

Strength is something you never have to worry about when using Bethlehem blanks. They're sound, strong, solid steel all the way through—steel that's been forged and rolled to impart uniform density and just the right grain structure. Actually, because of their high strength, you can often use thinner sections, thus effecting a saving of weight.

But there are other good points to keep in mind, too. For instance, you're almost bound to agree with the long-time user of Bethlehem blanks who recently wrote: "One of the most important advantages is their ease of machining. . . . The solid, clean metal in the forged blanks is particularly appreciated in gear-tooth-cutting operations."

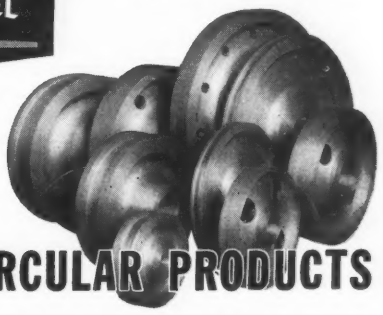
These blanks are especially fine for heavy-duty applications like gears, crane and sheave wheels, turbine rotors, flywheels, tire molds, brake wheels, etc. They come in sizes from approximately 10 to 42 in. OD, with heat-treating optional.

For further details, ask for illustrated Booklet No. 216. It shows various steps of manufacture, pictures of blanks before, during and after machining, and many applications of the products.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

BETHLEHEM STEEL

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation



BETHLEHEM ROLLED-AND-FORGED CIRCULAR PRODUCTS

Photo Courtesy The Messinger Mfg. Co., Tatamy, Pa.

FACTS on improving production!

The Messinger Mfg. Co., famous for over 90 years as manufacturers of agricultural implements and woodworking machinery, replaced six machines with three modern Jones & Lamson Turret Lathes.

Now, large and small lots of sheaves, bearing caps, blowers, blower cases, worm gear housings, etc., are turned with peak efficiency and economy. ONE YEAR'S SAVINGS, BASED ON DIRECT COSTS ALONE, MORE THAN PAID FOR THE THREE NEW MACHINES AND EQUIPMENT.

3 Jones & Lamson Turret Lathes do the work of 6 other machines better, faster, cheaper!

Jones & Lamson Turret Lathes are Built and Powered to produce — MORE CHIPS PER TOOL — MORE PIECES PER HOUR — MORE PROFIT PER JOB — *than any other turret lathe of comparable size.*

Now, more than ever, the most efficient machines and methods are needed to make the most of your available manpower and material. Jones & Lamson is ready, willing and able to help you get maximum results from your turning, threading and inspection operations. Write *today* to Department 710.

Turret Lathes—Fay Automatic Lathes—Thread Grinders—Optical Comparators—Threading Dies

JONES & LAMSON
MACHINE COMPANY
Springfield, Vermont, U.S.A.

Machine Tool Craftsmen Since 1835

THE FIGHTING MACHINE. Tanks of this type are equipped with track pins of the type shown at the left.

THE BRUSHING MACHINE. Molded track pins are fed in one at a time. An Osborn Disc-Center Wire Wheel Brush meshes with each of six sections where flash and film are to be removed. Areas are cleaned thoroughly in a few seconds and pin is discharged.

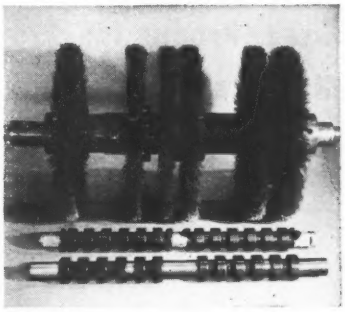
What plays clean-up on the rubber-steel team?

...a brush! These are track pins of army tanks. Here, rubber "tires" are bonded to steel pins to produce strong, quiet-operating parts for the rigors of tank warfare.

The problem was to remove the rubber flash and film from six bearing and electrical-ground sections of the pin after molding. With the help of the **O**sborn **B**rushing **A**nalyst, a machine with six Osborn Disc-Center* Wire Brushes was devised to remove the excess rubber from all six areas simultaneously . . . in a matter of seconds.

Throughout all industry, Osborn power brushes are simplifying cleaning and finishing operations and improving products of every description. Here's how an **O**sborn **B**rushing **A**nalyst can help you. Call or write, *The Osborn Manufacturing Company, Dept. 514, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

*Trademark



THE BRUSH SET-UP. This photo shows construction of arbor with six Osborn Brushes spaced to fit into track pin grooves where rubber is to be removed. In the foreground are track pins before and after brushing.

OSBORN

LOOK FOR THE NAME OSBORN...RECOGNIZED EVERYWHERE FOR QUALITY WORKMANSHIP AND MATERIALS

EX-CELL-O

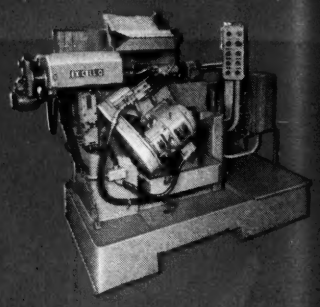
Blade Machining Equipment

NOW AVAILABLE

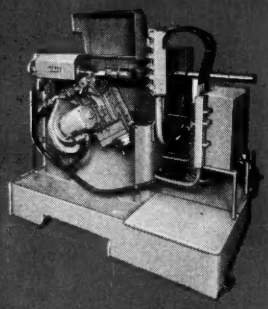
Compressor blade for turbojet aircraft engine.

XLO
EX-CELL-O for PRECISION

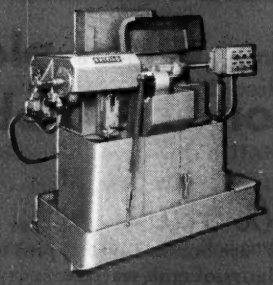
Three Production-Proved Machines Mill, Grind and Polish Airfoil Forms



Ex-Cell-O Precision Profile Miller, Style 86, mills the complete airfoil form including leading and trailing edges. Work is supported rigidly by back rests throughout the cutting stroke.



Ex-Cell-O Precision Profile Grinder, Style 87, grinds the complete airfoil form including leading and trailing edges. Work speeds change automatically during rotation as area of contact between wheel and work varies.



Ex-Cell-O Precision Profile Polisher, Style 88, polishes the airfoil form with an abrasive belt which passes over a rubber pulley at point of work contact.

The complex job of finishing the airfoil form of compressor blades for jet aircraft engines is now done speedily, accurately, and automatically by three Ex-Cell-O standard machines. Production-proved, these machines mill, grind, and polish, respectively, with completely automatic machining cycles. Operator merely loads, unloads, and pushes start button. For further information and specifications contact Ex-Cell-O in Detroit today.

EX-CELL-O

CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS CUTTING TOOLS • RAILROAD PINS AND BUSHINGS DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

STEEL

The Weekly Magazine of Metalworking

VOL. 129 NO. 5 **JULY 30, 1951**

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***Next Week*... A More Realistic Measure of Shot Peening Effectiveness... Machine Tools Self-Controlled by Air Electric Gage System... Selecting Linings for Various Types of Service in Hot Metal Cars and Mixers**

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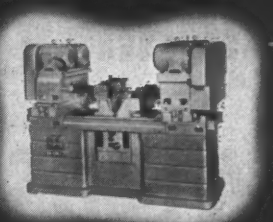
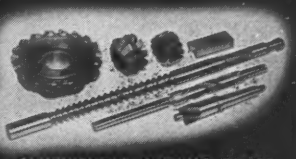
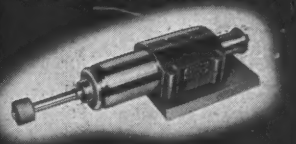
XLO
EX-CELL-O for PRECISION



PRECISION MACHINE TOOLS

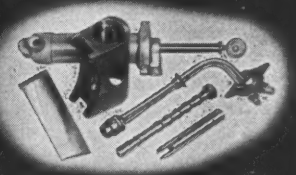


CONTINENTAL CUTTING TOOLS

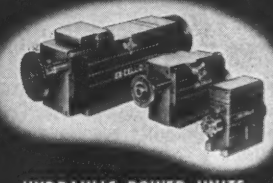


PRECISION GRINDING SPINDLES

DRILL JIG BUSHINGS



AIRCRAFT AND PRECISION PARTS



HYDRAULIC POWER UNITS

Products of

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DETROIT 32, MICHIGAN

51-18

SPEED Cleaning of WELDS with PELRON KLEENWELD *Anti-Spatter* COMPOUND

prevents weld spatter sticking to metals.

—

- **Water soluble, for easy application**
- **High heat resistant, will not smoke, has no flash point.**
- **Does not interfere with painting.**
- **Non-inflammable, non-toxic.**
- **Apply by brush, spray or dip.**

—

KLEENWELD is another PELRON product for better, easier metalworking, sharing the high acceptance of PELRON cutting, grinding, drawing and cleaning compounds.

Have you a problem involving these various processes? Tell us about it—possibly we have, or can develop, a product that will lick it!

Write the nearest PELRON office for free information and consultation.

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Behind the Scenes...

Globaloney?

We note that Globe Slicing Machine Co. has moved to an office in New York just across from United Nations headquarters. To us that's an alarming juxtaposition. The Russians will probably comment on it in *Pravda*.

Happy Belated Birthday to Us

Well, it has happened. After years of forgetting Aunt Mabel's birthday, we have finally let our own slip by unnoticed. We should have commented on the event more than a month ago, for Shrdlu first burst into print—in little 6 point type—on June 10, 1935.

We're a little more than 16 years old now, a difficult time friends with teen-age children tell us. We should be pestering the old man to let us have the car, going out with girls more and talking for hours on the telephone. Come to think of it, we are talking a lot on the telephone.

Sidetracked

In looking over past "Behind the Scenes" performances, we wandered into the market section of STEEL somehow and began looking into 1941 prices. STEEL's price composite on finished steel in July of that year was $56.60 per net ton. This month it's more than $106. The composite per gross ton on scrap was $19.16 just ten years ago. It's $44 now. Ah, the good old days!

We've just counted them, and we're glad to report that STEEL carries 6149 separate price entries as a price and market reporting service for you every Monday. Those 6149 begin on page 108 this week and are 65 per cent more entries than carried by any other publication. STEEL carries 39 per cent more semifinished and finished steel entries than any other publication.

The Perils of Research

Speaking of wandering as we were in the previous item, we are reminded that wool-gathering is quite a problem with us whenever we are engaged in bookish research. When we look up a word in the dictionary, say "juxtaposition," we must keep a firm rein on ourselves not to wander down the column to learn that jynx is derived from the French, jynges, and means a charm or spell and that Jynx with a cap J is a genus of woodpeckers consisting of the wrynecks.

But our real pitfall is the encyclopedia. We should have known better, but we looked up wrynecks in *Britannica* which archly describes the bird as a "summer visitant to most parts of Europe, generally arriving a few days before the cuckoo." After that we were hopelessly lost and wandered down the page to Wuhu, which is a Chinese port in Anhwei province on the south bank of the Yangtze river.

Cover Story

Eagle-eyed readers familiar with electric steelmaking will note that our cover this week carries a picture of a side-charged electric furnace, not the more modern top-charged unit. The problems of fumes and lighting have to date thwarted even the most intrepid photographers in trying to shoot the top-charged furnace. The editors simply couldn't find or have taken a satisfactory shot, so they had to make do with the side-charged job.

Knowing photographers, we have a hunch some of them will soon solve the problems. In fact, we would hesitate to bet that a superlative shot won't be forthcoming within a week after this is published.

The story to which the cover refers begins on page 74 and is STEEL's appraisal of what's ahead in electric steelmaking.

Puzzle Corner

Charley and Joe, wishing to determine the weight of a fish they had caught on the French river in Canada, balanced a plank on a fence, and then balanced each other on the plank. They then exchanged places, but this time Charley, the lighter man, held the fish in his lap. They found the plank balanced again. If Charley weighs 150 pounds and Joe 180 pounds, what did the fish weigh?

E. Buschow of Surface Combustion Corp., Robert W. Huff of Canton, O., and C. E. Blass of Talon Inc. were the first in with the correct answer to the hat-in-the-river problem of July 16. The river current flowed two miles per hour.

Shrdlu

(Metalworking Outlook—Page 27)

Wellman will build it

Special Cranes
Ore Bridges
Gas Producer Plants
Charging Machines
Industrial Furnaces
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Skip Hoists
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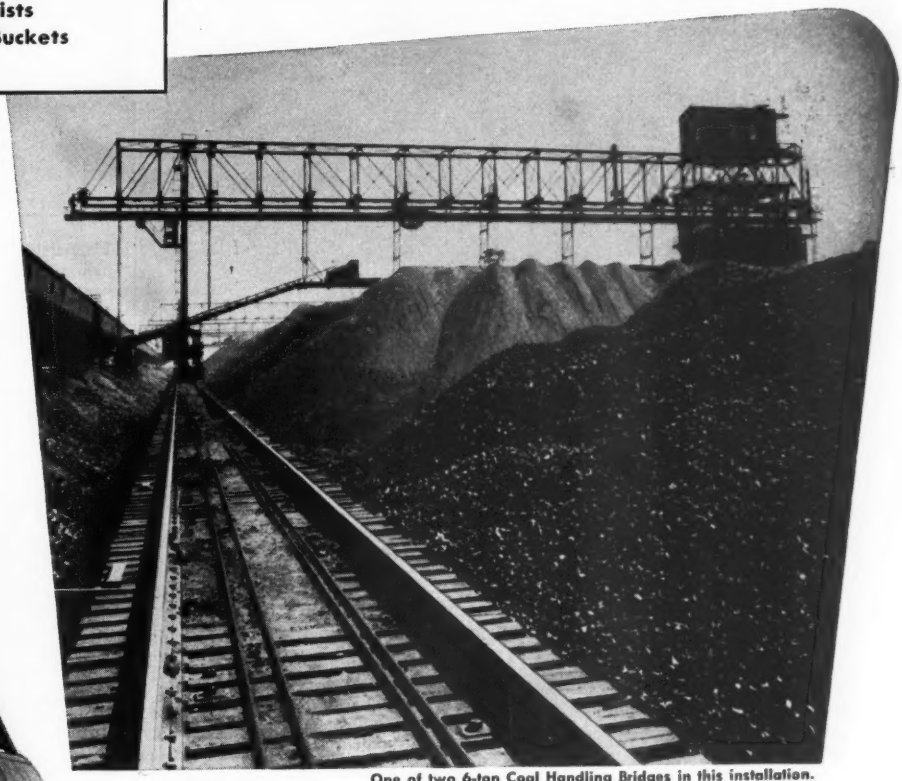
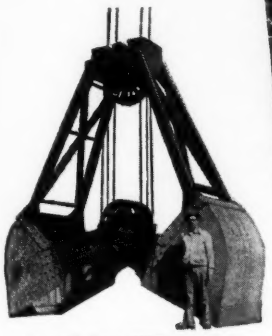
Wellman Ore and Coal Handling Bridges

For fast and efficient action



One of two 6-ton Coal Handling Bridges in this installation.



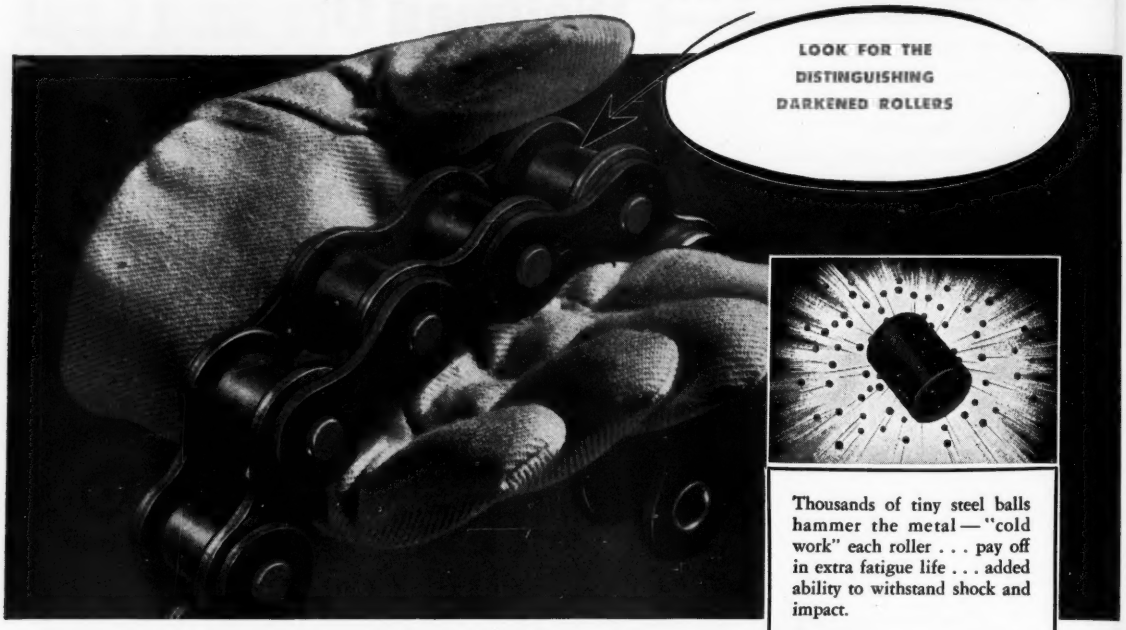
6-ton Wellman Williams Type Coal Bucket used with these bridges.

• Take advantage of Wellman's long experience in designing and building handling bridges in many types and capacities. Your selection from the complete line will provide fast and efficient handling of coal or ore.

THE WELLMAN ENGINEERING COMPANY

7029 CENTRAL AVENUE • CLEVELAND 4, OHIO

Here's how you can tell the chain with SHOT-PEENED rollers...



Thousands of tiny steel balls hammer the metal — "cold work" each roller . . . pay off in extra fatigue life . . . added ability to withstand shock and impact.

...the chain that has extra fatigue life

YES, you want to be sure you get shot-peened rollers on the next roller chain you buy. Shot-peening gives rollers the extra fatigue life needed to take repeated shock and impact loads.

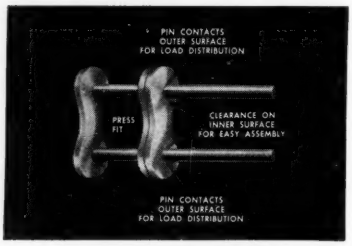
These chains are high in tensile strength, durable under severe loads, relatively light in weight and uniform in pitch. This accounts for their wide acceptance throughout industry for both drive and conveying purposes.

Thanks to constant research and precise manufacturing controls, every Link-Belt Precision Steel Roller Chain meets the highest standards for uniform strength. You get a positive, long-life drive — unaffected by heat, cold or moisture.

Link-Belt Roller Chain is available in single or multiple widths, in ⅜ to 3 in. single and double pitch. For all the facts, call your nearest Link-Belt office.

LINK-BELT

PRECISION STEEL ROLLER CHAIN



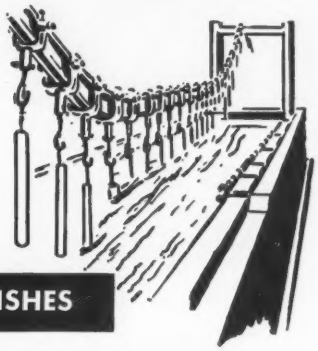
Easier coupling
and uncoupling without sacrificing load distribution

Patented E-Z Assembly feature of Link-Belt Precision Steel Roller Chain has won world-wide approval. Coupling and uncoupling of multiple width chains — right on the job — is far easier. There's absolutely no sacrifice of load distribution . . . no loss of the chain's remarkable performance. Press-fits between chain pins and middle bars have been modified. But full load carrying capacity across the entire width of the chain has been maintained.

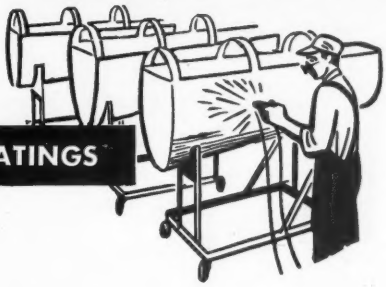
LINK-BELT COMPANY: Indianapolis 6, Chicago 9, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in principal cities. 12,332

Is Your Finishing Problem one of COATING METALS?

You'll find United Chromium a big help to you in operations requiring...



CHROMATE FINISHES



ORGANIC COATINGS

ELECTRO-DEPOSITED METALS

When you run into a snag on a defense order because of *finishing* problems, you can get under way faster and with less wasted expense through the help of United Chromium's finishing engineers. You benefit by their specialized knowledge of coatings for metals—and the recognized advantages of Unichrome plating processes; protective paints, lacquers and synthetics; chemically produced finishes.

To cite a few: Unichrome Dips and Anozinc*are easy-to-use, economical products employed to meet government specifications for chromate conversion coatings on zinc. Unichrome Lacquers and Enamels for armaments, aircraft, etc. . . . Unichrome SRHS Baths for 20% to 80% faster hard chromium plating . . . Unichrome Copper Plating Process yields a dense deposit ideal for masking in nitriding and carburizing.

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UNICHROME Trade Mark

COATINGS for METALS

Your Arcos Field Engineer Can Help KEEP YOUR PRODUCTION GOING

ARCOS STAINLESS, LOW HYDROGEN, NON-FERROUS ELECTRODES

Application Chart

GENERAL TYPE	USUAL WELDING APPLICATIONS	POPULAR NAMES	AWS-ASTM SPEC.	ARCOS GRADE	CURRENT	ARCOS NO.	COATING TYPE	COATING COLOR	STUB END COLORS END	STUB END COLORS SIDE
	Cavitation Resistance	17/7		Chromend 16/7	DC	D-301	Lime	Green	Yellow	Black
	Armor	19/9Mo		Chromend 19/9Mo	DC	D-307	Lime	Green	Black	
	Types 301, 302, 304, 308	19/9 or 18/8	E308-15	Chromend K	DC	D-308	Lime	Green	Yellow	
	Type 309, or for joining 18/8 stainless to mild steel.	25/12	E308-16	Stainend K	DC	D-308	Titania	Brown		White
	Similar to Type 309 for welds requiring columbium	25/12Cb	E309-15	Chromend HC	AC-DC	A-308	Lime	Green	Black	
	Type 310, or stainless clad, or stainless to mild steel.	25/20	E309-16	Stainend HC	DC	D-309	Titania	Brown		Blue
	Similar to Type 310 for welds requiring columbium or titanium.	25/20Cb	E310-15	Chromend 25/12Cb	AC-DC	A-309	Lime	Green	Black	
	Joining to Low Alloy Steels	25/20Mo	E310-16	Stainend 25/12Cb	AC-DC	A-309Cb	Titania	Brown		
		20/9		Chromend HCM	DC	D-309Cb	Lime	Green	Red	
		18/12Mo		Stainend HCM	AC-DC	A-309Cb	Titania	Brown		
		19/12Cb	E310-15	Chromend 25/20Cb	DC	A-310	Lime	Green	Red	Blue
			E310-16	Stainend HCM	AC-DC	A-310	Titania	Brown		White
				Chromend 25/20Mo	DC	D-310Cb	Lime	Green	Green	Red
				Chromend 29/9	DC	D-310Mo	Lime	Green		
			E316-15	Chromend K-Mo	DC	D-312	Lime	Green	Yellow	
			E316-16	Stainend K-Mo	DC	D-316	Titania	Brown		
				Chromend K-MoCb	AC-DC	A-316	Lime	Green	Yellow	
				Stainend K-MoCb	AC-DC	D-316Cb	Titania	Brown		
			E317-15	Chromend 18/8Mo	DC	A-316Cb	Lime	Green	Yellow	
			E317-16	Stainend 18/8Mo	AC-DC	D-317	Titania	Brown		
				Chromend 20/29CuMo	DC	A-317	Lime	Green	Green	Red
					DC	D-320	Lime	Green		
					AC-DC	A-317	Titania	Brown		
					DC	D-322	Lime	Green		
					DC	D-329	Lime	Green		
					DC	D-330	Titania	Brown		
					AC-DC	A-330	Titania	Brown		
					DC	D-347	Lime	Green		
							Titania	Brown		
							Lime	Green		
								Green		
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								Green		
								Green		
								Green		
								Lime		
								Titania		
								Lime		

Your Arcos representative can be more helpful to you now than ever before. He can help you—

- Select electrodes to meet defense specifications
- Often find alternate electrodes for the job
- Locate available electrodes of a different diameter that can do the job
- Advise on welding techniques to step up production

Get in touch with your Arcos representative today. He will do his best to help you keep your production rolling.

ARCOS CORPORATION

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STEEL

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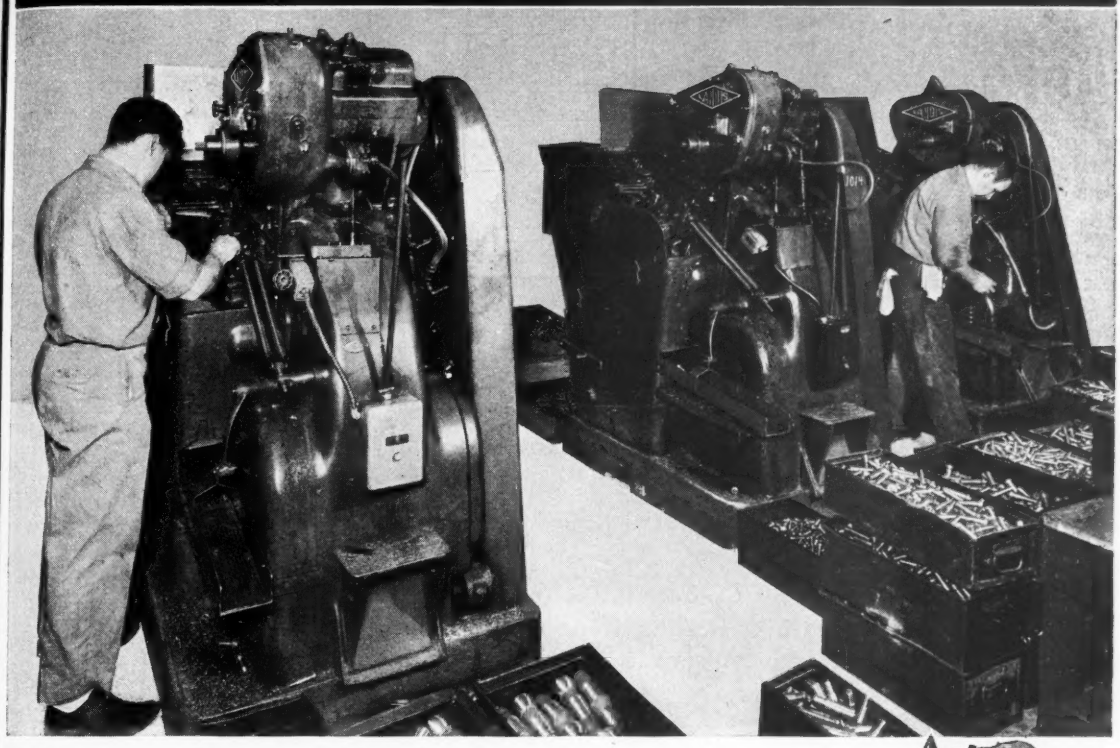
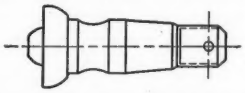
LANDIS "Automatic" PROVED BY PRODUCTION . . . .



Points and Threads 1020 Ball Studs per hour

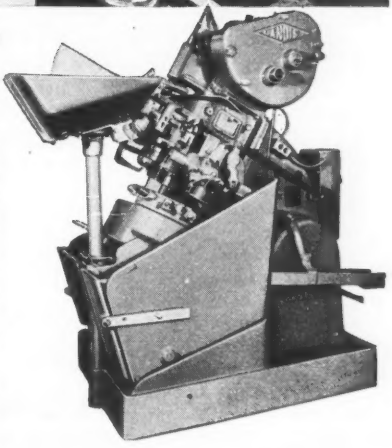
Through the use of LANDIS Automatic Forming and Threading Machines, a large manufacturer has solved his problem of mass-producing certain automotive parts.



The workpieces are cold-forged blanks, from which ball studs are made. Specifications require a 45° point and a 9/16" 18-pitch N.F. thread cut to a length of 5/8". In constant daily operation is a battery of LANDIS Automatic Forming and Threading Machines, each of which point and thread 1020 pieces per hour. Four hours of production are obtained between each chaser grinding, resulting in low tool cost and minimum machine down time.

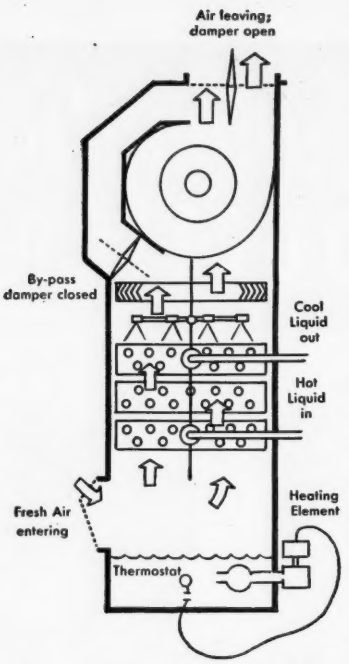
Because of their universal features, LANDIS Automatic Forming and Threading Machines are adaptable to mass-production operations on a wide range of automotive parts. By means of pick-off speed change gears, the machine cycle can be varied to accommodate any combination of thread length, pitch, and thread diameter, within the capacity of the machine—therefore this machine is adaptable to a wide variety of work. Hopper feed and automatic operation throughout enable one operator to keep a battery of machines in constant production, while set-up changes of all types can be made in minimum time.

Can you revolutionize your pointing and threading operations with LANDIS Automatic Forming and Threading Machines? Please give specifications when writing for complete information.



LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA

NIAGARA Aero Heat Exchanger



U. S. Reissue Patent Nos. 22,533 and 22,553

1. Extends quenching capacity without extra water or cooling tower.
2. Quickly pulls down heat at initial peak load of Quenching.
3. "Balanced Wet Bulb" Control holds quench bath at proper temperature, heating if needed to start after shut-down, and cools or heats by automatic control.
4. Saves cleaning expense as compared to cooling tower which picks up acids and fumes from air.

APPLICATIONS	USED IN THE MANUFACTURE OF OVER 400 PRODUCTS INCLUDING
Quench Oils	Aluminum, copper, steel, nickel and alloys.
Cutting Oils	Diesel, aircraft, automotive and other engines.
Lubricating Oils	Chemical processes, plastics, adhesives.
Cooling water and brine	Gears, bearings, forgings and castings.
Cooling gas and compressed air	Wire, controls, electronic products.
	Ammunition, explosives, shells, ordnance, firearms.
	Farm machinery, tools, hardware.

For help in increasing production, saving of cooling water, write for Bulletin #120. Address

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LETTERS
TO THE EDITORS

No Distribution Problem

Thank you for sending copies of the Guide to CMP.

A member of our firm recently made a trip to Washington and found STEEL's guide distributed to the production control administration in the department that seemed to be working on regulations.

George H. McDowell, president
Johnson City Foundry & Machine Works Inc.
Division of Tennessee Bridge & Steel Co.

Cupal: The U. S. Outlet

Can you advise us the name of the U. S. firm which will distribute the new copper and aluminum bimetal called Cupal? (STEEL, July 2, p. 73)

Hugh F. Lenz
The Deutsch Co.
Los Angeles

• *Distributor is Eastern Brass & Copper Co. Inc., 1130 E. 180th St., New York. Herbert Barchoff is executive vice president.*

British Engineers Score

STEEL reports British engineers have perfected a machine for automatic honing of forged Nimonic gas turbine buckets. (July 2, p. 73). Where can we get more data?

J. C. Mahanna
Kelsey-Hayes Wheel Co.
Detroit

• *Write to Bristol Aeroplane Co. Ltd., Filton House, Bristol, England.*

Interest in "Autox" Process

Our plant is definitely interested in obtaining more information on the "autoxidation process" noted in STEEL (July 2, p. 73) under the title, "Recycling Pickling Wastes." What British engineers were responsible for this work?

W. O. Kugler, chemist
Pressed Steel Tank Co.
Milwaukee

Where can we get more detailed information on your item, "Recycling Pickling Wastes?"

L. C. Flickinger, chief chemist
Youngstown Sheet & Tube Co.
Youngstown

• *STEEL's item was based on a discussion by J. Pearson, British Iron & Steel Research Association; it was published in the June, 1951, issue of Sheet Metal Industries, 49 Wellington St., Strand, London W. C. 2. The association is erecting a pilot scale "autox" plant.*

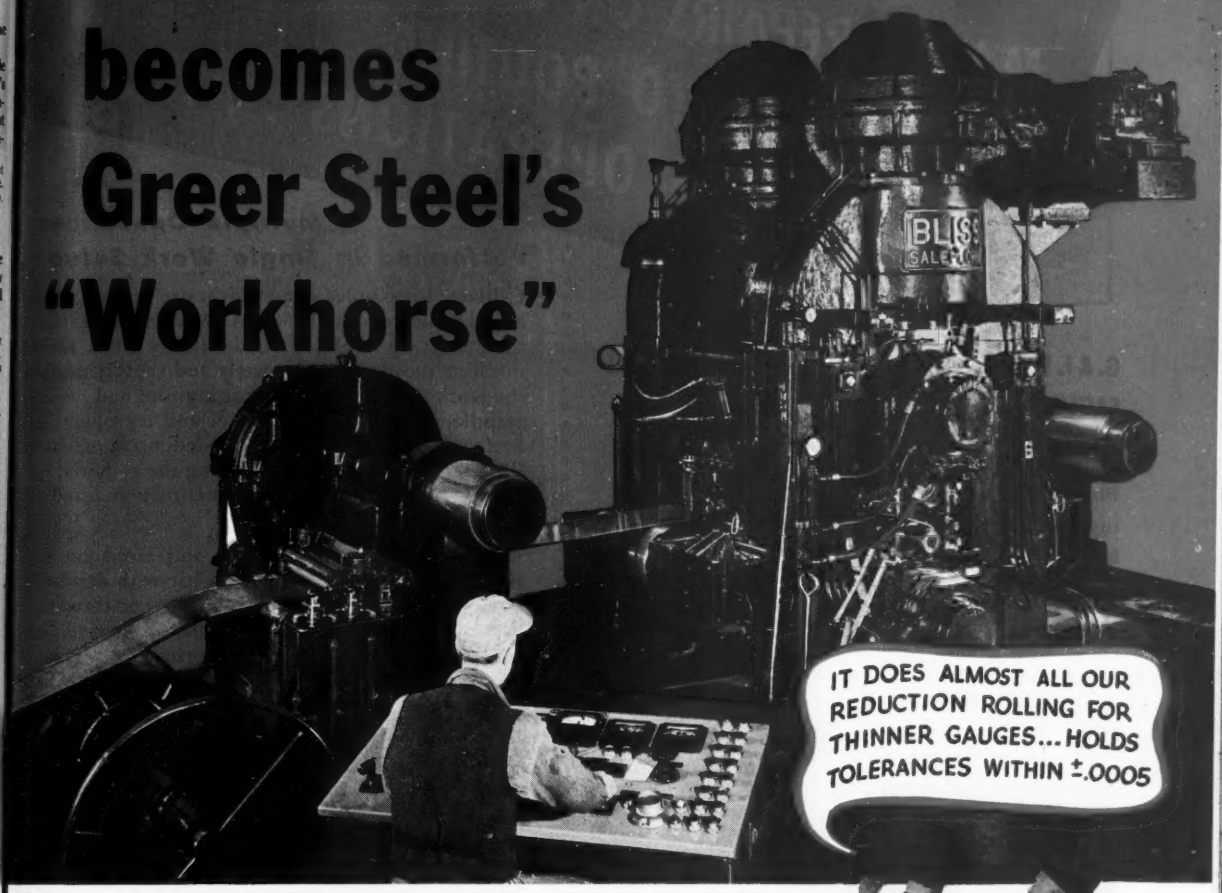
Just for the Record

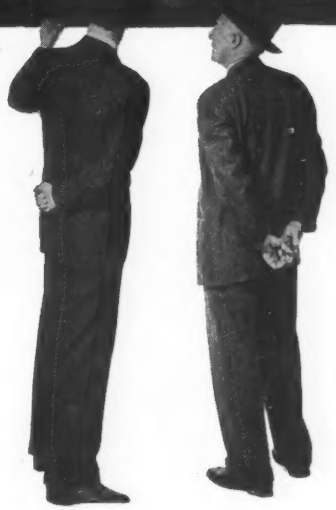
When did STEEL publish plans of U. S. Steel Co. to erect its new plant at Morrisville, Pa., and the National Tube Co. to build at Paulsboro, N. J.?

• *U. S. Steel's Morrisville project was reported Jan. 16, 1950, p. 34; that of National Tube at Paulsboro was noted Jan. 8, 1951, p. 25.*

H. S. Kamsler
Box 168—Central Post Office
New York

New BLISS Reversing Mill becomes Greer Steel's "Workhorse"





It takes a rugged, versatile mill to maintain exacting standards for quality of finish and accuracy of gauge on short runs and quick changeovers. A new Bliss 4-high reversing mill, specially designed to meet "job-shop" requirements, was the answer for the Greer Steel Company, Dover, Ohio.

The new Bliss mill has oversized sections to take severe usage. It has material-handling aids and precision controls for quick and safe changeovers. Already known as "the Greer workhorse," because it handles practically all the heavy draught work at Greer, the Bliss mill rolls carbon and alloy steels in all tempers. Reductions of 25% on the first pass are not unusual. Metal thicknesses are reduced as much as 90% and finish gauges as thin as .005". Tolerances at times are held within .001". Mill speed regularly exceeds the rated 1000 fpm.

Greer also likes its new Bliss mill because every practical feature for its universal usage is built in. This includes a back-up roll changer (concealed in floor when not in use), coil box, roll breaker, expanding mandrels and sticker guides.

Bliss rolling mill engineers can meet your special requirements, too. Write for further information.

E. W. BLISS COMPANY, General Office: Canton, Ohio
ROLLING MILL DIVISION: SALEM, OHIO

MAJOR REPAIRS ON DIESEL ENGINES CONVERTED TO ROUTINE MACHINING OPERATIONS . . . . .

G. & L. FLOOR TYPE MACHINE WITH ROTARY TABLE EASILY GEARS RAILROAD SHOPS TO ALL URGENT AND UNUSUAL REPAIR DEMANDS

Boring cylinder liner holes and main bearings; milling distorted crankcase sections; turning cylinder heads; milling and boring camshaft bearing seats are but a few of the major Diesel repair operations easily performed on the versatile G. & L. Floor Type Machine with Rotary Table.

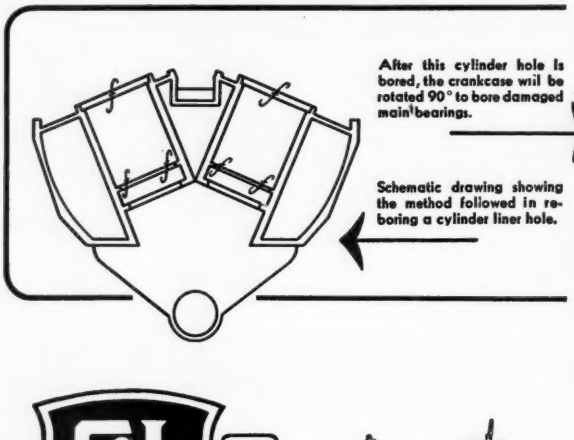
This advanced machining practice followed in progressive railroad shops ends the need to return major Diesel engine components to the original manufacturer for repairs. As a result, *out-of-service* time is reduced to a minimum.

Multiple Operations Performed in Single Work Setup

Cylinder liner holes distorted in use are quickly realigned and rebored on this G. & L. machine. Once the crankcase is placed on the rotary table, various machine movements accurately and rapidly position the work in relation to the cutting tool and machine spindle. No time is lost in cut and try operations. Scales and verniers are depended upon to locate bore center distances. Completing the required boring operations, the rotary table is then indexed 90° to bore the main bearings.

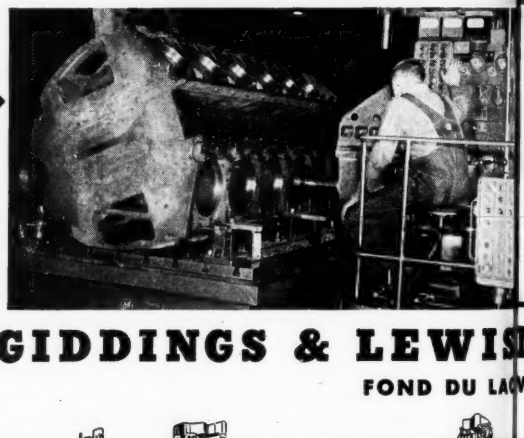
All bearings may be bored and faced on both sides, using a Davis line boring bar with expanding retracting type cutters. Or, if only two or three main bearings require reboring, the nearest sound bearings are bushed to support the boring bar as it bores and aligns the damaged unit.

Machining repair problems in Diesel shops are quickly and easily solved with this versatile G. & L. machine. You can end excessive locomotive down-time with this machine. Ask experienced G. & L. engineers how.



After this cylinder hole is bored, the crankcase will be rotated 90° to bore damaged main bearings.

Schematic drawing showing the method followed in reboring a cylinder liner hole.



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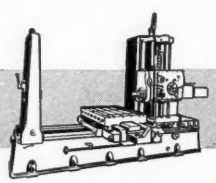
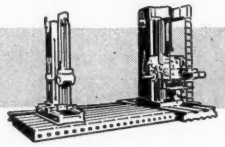
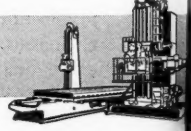
G&L HYPRO



G. & L. Table Type Horizontal Boring Machine

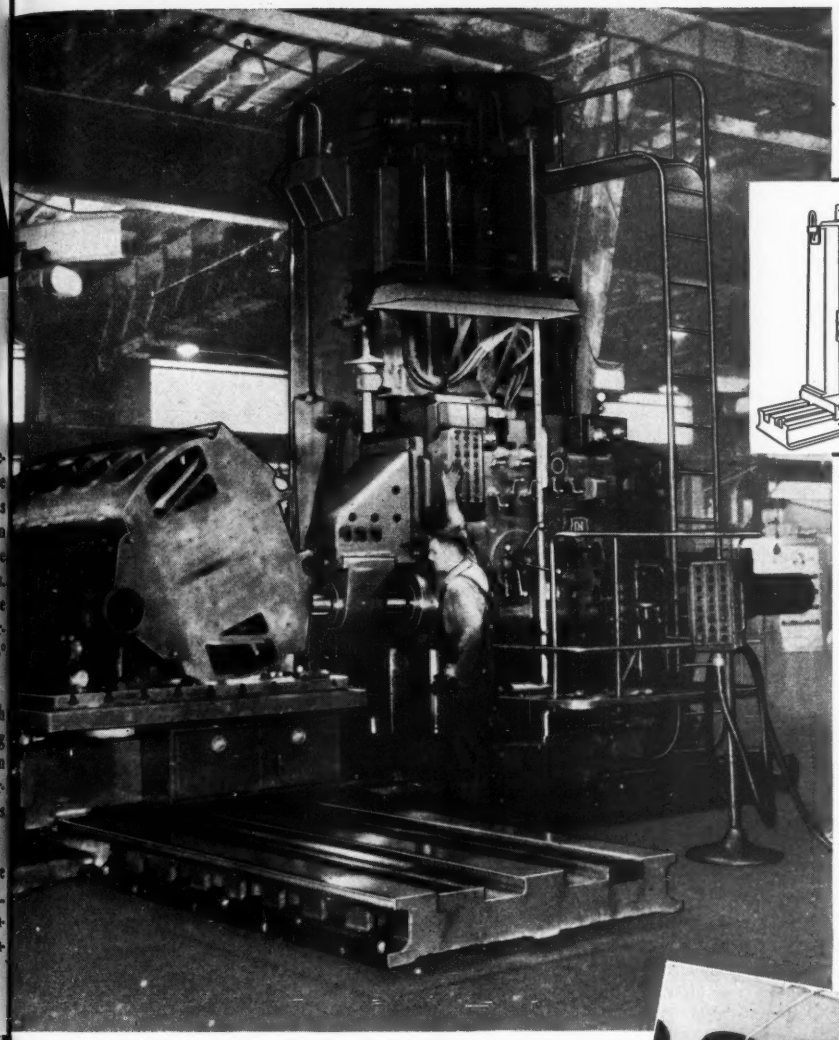


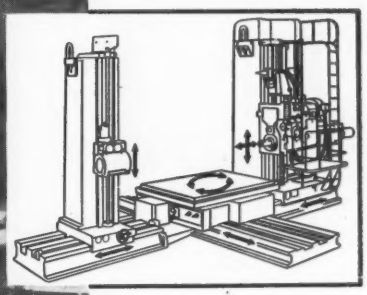
G. & L. Floor Type Horizontal Boring Machine



G. & L. Planer Type Horizontal Boring Machine

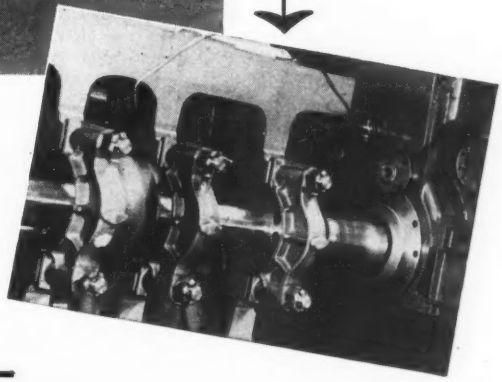
G. & L. Double H





Only a single setup of this Diesel crankcase is required to perform different repair operations. Machine movements plus rotary table movements provide unusual flexibility for rapid positioning.

Reboring or refacing a main bearing is accomplished by bushing two bearings to support the bar. This is a typical G. & L. operation.



Typical Diesel Repairs Handled

1. Line bore main bearings.
2. Re-serrate main bearings and caps.
3. Reface traction motor housings.
4. Rebore suspension bearings and end shields.
5. True crankcase by milling.
6. Re-machine mounting pads and surfaces.

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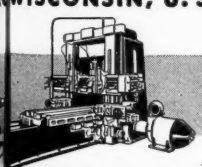
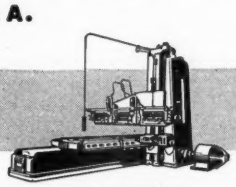
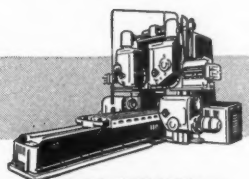


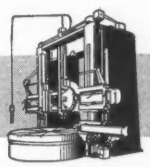
G. & L. HYPRO Double Housing Planer



G. & L. HYPRO Openside Planer



G. & L. HYPRO Planer Type Milling Machine



G. & L. HYPRO Vertical Boring and Turning Mill

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Today's Wise Buy

Now, more than ever, it pays to look upon your truck purchase as an investment...one that should yield you long-term dividends in dependability and economy. Measured that way, you'll find there's no other truck to match a Mack.

Long-lasting, profit-making Mack performance is well demonstrated by Mack Model A-40 Series (23,000 lbs. g.v.w. to 53,000 lbs. g.c.w.) which cover a wide utility range as trucks, tractors, four or six-wheelers.

Like all Macks, these popular trucks are built with extra strength and sturdiness in every part...give you assurance of sustained, uninterrupted operation should trucks become difficult to replace during the uncertain period ahead.

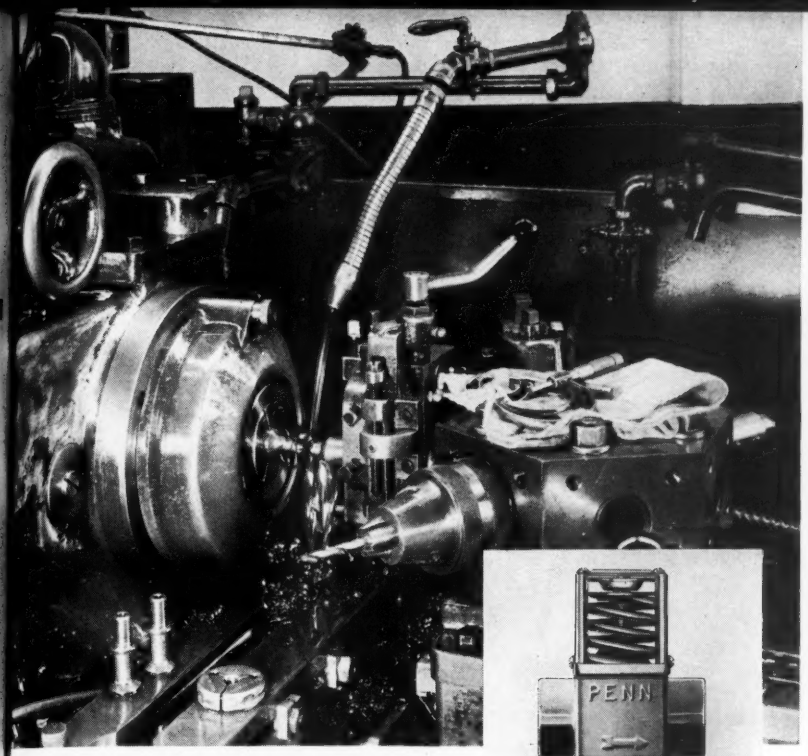
Your nearest Mack branch or distributor will explain to you what "Built Like A Mack" means in extra long life and low-cost operation...why Mack is *today's wise buy* in trucks.

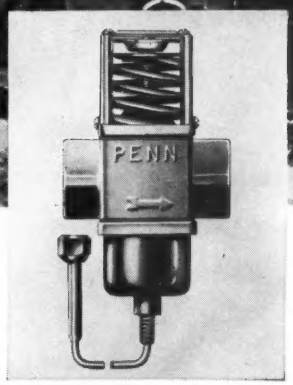
Mack TRUCKS

...outlast them all

Mack Trucks, Empire State Building, New York 1, N.Y. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N.Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Peter A. Frasse Co., Inc. of New York City found out that Mack trucks were a "wise buy" way back in 1920. They've been buying them ever since. Latest to join their fleet is this hard-working Mack.





Above—View of turret lathe operation employed by Penn Electric Switch Co. to produce parts for water regulator.
Right—Exterior view of the Penn Type 246 Water Regulator for water cooled refrigeration compressors.

Still at the head of the cutting oil class...

THE tests began more than six years ago. At that time, operators of the Penn Electric Switch Company of Goshen, Indiana, were seeking a cutting oil best suited to a variety of lathe operations on monel metal, various grades of steel, and other ferrous metals. Among the oils tested was STANICUT Oil 155CS recommended by a Standard Oil lubrication specialist.

All cutting oils were put through the same exacting tests.

STANICUT came out ahead, performing the most satisfactory job on each operation. Its versatility convinced plant operators that it could handle a wide range of jobs in their lathe department.

For example, production of one monel metal part for Penn Electric's Type 246 Water Regulator includes drilling, forming, and threading . . . with STANICUT assuring long tool life and fine finish.

From time to time during the past six years, other cutting oils have been tested against STANICUT. STANICUT is still at the head of the cutting oil class.

STANICUT
TRADE MARK
Cutting Oil

This company's experience with the advantages of STANICUT can be *your* plant's experience too. And you can profit further through the engineering services of a Standard Oil lubrication specialist. See at the right how to avail yourself of his services.

Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Ill.

What's YOUR problem?

If your plant is located near South Bend, here is a man you ought to know. He's E. O. Smith, lubrication specialist in Standard Oil's office in that city. Mr. Smith recommended STANICUT Oil 155CS for use in the Penn Electric Switch Plant, thus helping that company find the very cutting oil they were looking for.

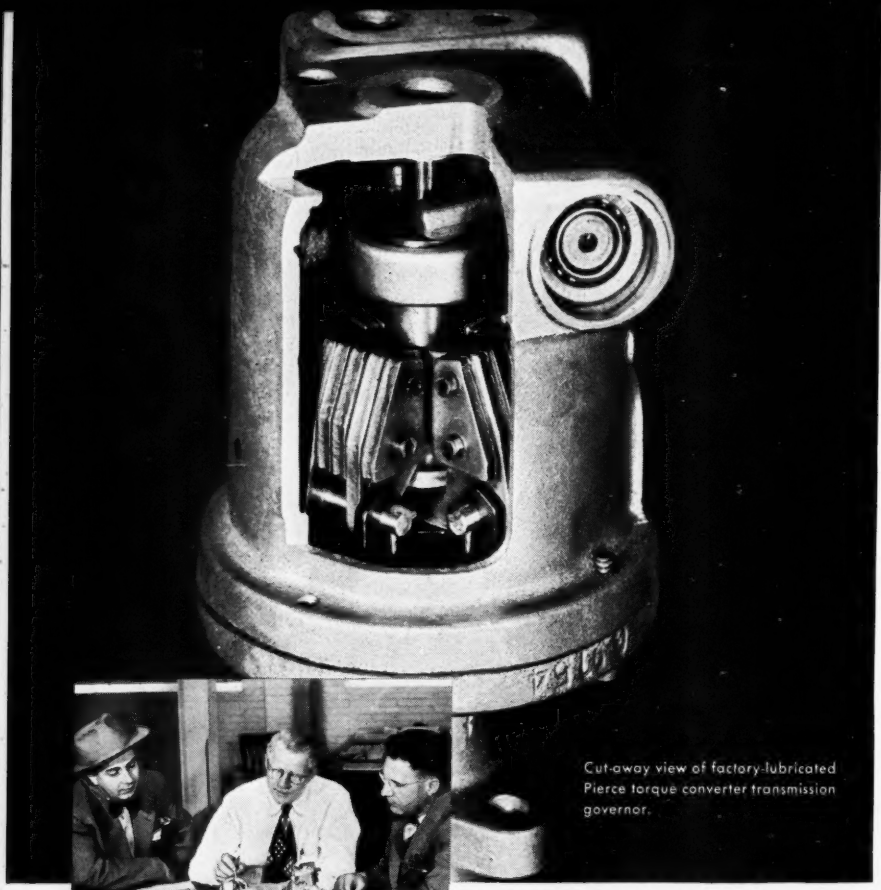
Mr. Smith and other able lubrication specialists are located in Standard offices throughout the Midwest. They have been specially trained in a Standard Oil Lubrication Engineering School and in addition have a wealth of on-the-job experience. The specialist nearest your plant is ready to give prompt, expert, thorough attention to your lubrication needs.

It's easy to obtain his services. A phone call or letter to your nearest Standard Oil Company (Indiana) office will bring him quickly to your plant . . . with no obligation to you, of course. He'll explain to you the advantages of many fine Standard products, among them...

STANICOOL HD Soluble Oil—Because it contains additional compounding, this soluble oil possesses not only the cooling ability of an emulsion but also the ability to give better tool life and finer finishes than can be obtained with a conventional soluble oil.

STANOSTAMP Compounds—Here are three established products for stamping or heavy drawing operations of either low-carbon or alloy steels. Water can be added to these paste compounds to provide the most economical application. STANOSTAMPS offer maximum protection for dies and work. These compounds can be readily removed in conventional washing equipment.

STANDARD OIL COMPANY (INDIANA) STANDARD



Cut-away view of factory-lubricated Pierce torque converter transmission governor.

Left to right: F. C. Hess, Standard Oil lubrication specialist, W. E. Benjamin, Pierce Governor Company engineer, and A. C. Gartley, Standard Oil Lubrication Engineer, discuss vital part played by STANOLITH Grease in pre-lubrication of Pierce governors.

Elected for governor job . . .

TO INSURE trouble-free lubrication of their product in the field, officials of Pierce Governor Company, Inc., Anderson, Indiana, initiated the production of a factory-lubricated sealed unit type governor.

A special grease was found that did the job, but as production of the sealed units mounted, this grease became a costly production item. That's when STANOLITH Grease, recommended by a Standard Oil Lubrication Specialist, was tried. In test block runs simulating 10,000 hours of actual operation, at speeds ranging up to 4,000 RPM and temperatures from 150°F. to 200°F., STANOLITH did an even better job than the original lubricant.

STANOLITH factory-lubricated governors now have been in service for over eight months with no troubles resulting from bearing failures, overheating, or leakage of the lubricant. STANOLITH's lower cost has been an added advantage.

STANOLITH
TRADE MARK
Greases

This is one of many success stories reported by users of STANOLITH. For the beginning of your own lubrication success story, call your local Standard Oil (Indiana) office for the services of a lubrication specialist.

Standard Oil Company (Indiana), 910 South Michigan Ave., Chicago 80, Illinois.

What's YOUR problem?

F. C. Hess, of Standard Oil's Indianapolis, Indiana, office, is the Standard Oil lubrication specialist who recommended STANOLITH to operators of the Pierce Governor Company, Inc., enabling them to make an appreciable cut in production costs.

Throughout the Midwest there is a corps of specially trained, experienced lubrication specialists ready to give you prompt, on-the-spot help with any lubrication problem. Each of these men has been carefully trained in a Standard Oil Lubrication Engineering School. It's easy to get the services of a lubrication specialist — just phone or write to your local Standard Oil Company (Indiana) office. When he stops by to see you, ask him about the following fine Standard products:

STANOIL Industrial Oils—This general-purpose line of oils provides cleaner operation of hydraulic units and supplies effective lubrication in compressors, gear cases, and circulating systems. One or two grades can replace a wide variety of special oils and lubricants.

CALUMET Viscous Lubricants—On open gears and wire rope, these greases strongly resist washing and throw-off. Their superior wetting ability affords better coating of gears, better internal lubrication of wire rope.

STANORUST Rust Preventives—The eight grades of STANORUSTs form one of the most complete and effective lines of rust preventives on the market today. Each has been scientifically developed for its intended use. The grades range from a fingerprint remover to a heavy petrolatum that protects against corrosion for years under the most severe outdoor exposure.

STANDARD **STANDARD OIL COMPANY (INDIAN**

Production up from 80 to 300 pieces per hour with a Warner & Swasey 5-Spindle Automatic

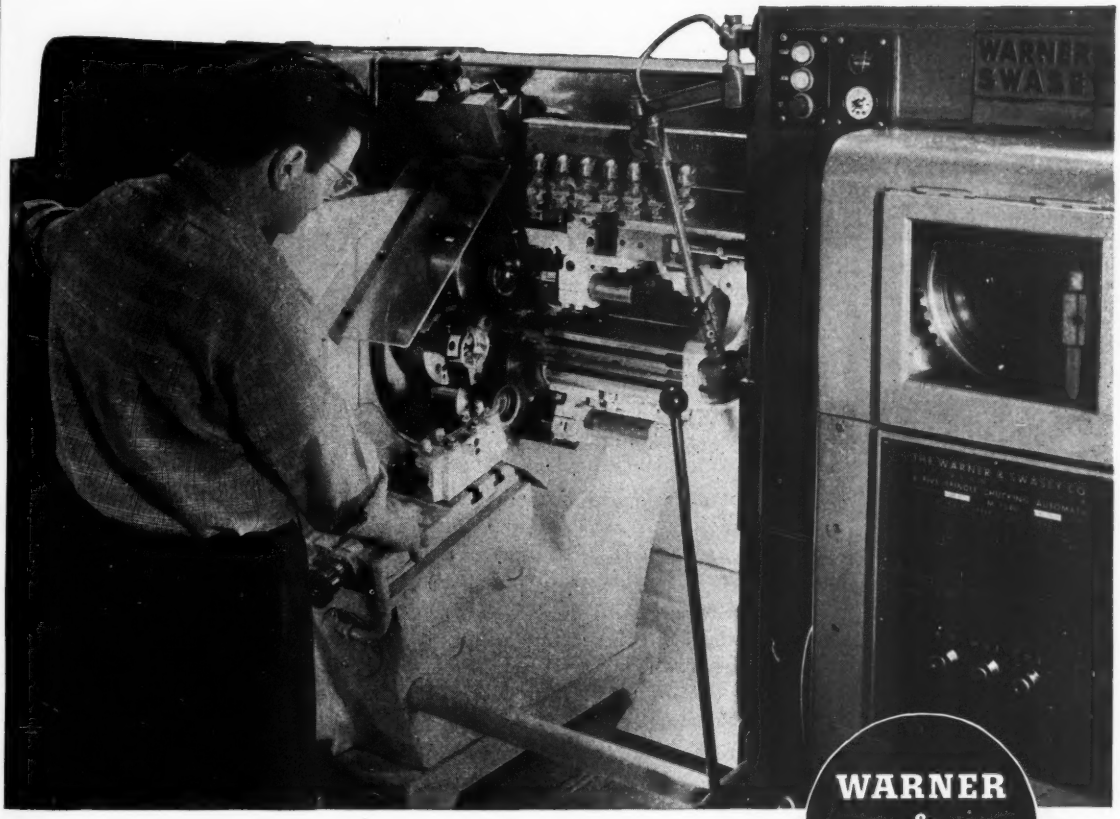
IN 1940 Badger Meter Manufacturing Company of Milwaukee worked three shifts to turn out their required production. Today they are able to achieve the same output with one shift, using the same floor space for production.

Practically all of these results are due to more efficient machine tools.

For instance, when Badger installed a Warner & Swasey 5-Spindle Automatic Chucking Machine, they had one main purpose in mind—to step up production. It did just that. Output on the standard register housing, used on all Badger meters for liquids, rose from 80 to 300 pieces per hour! In addition, better surfaces and closer tolerances were attained.

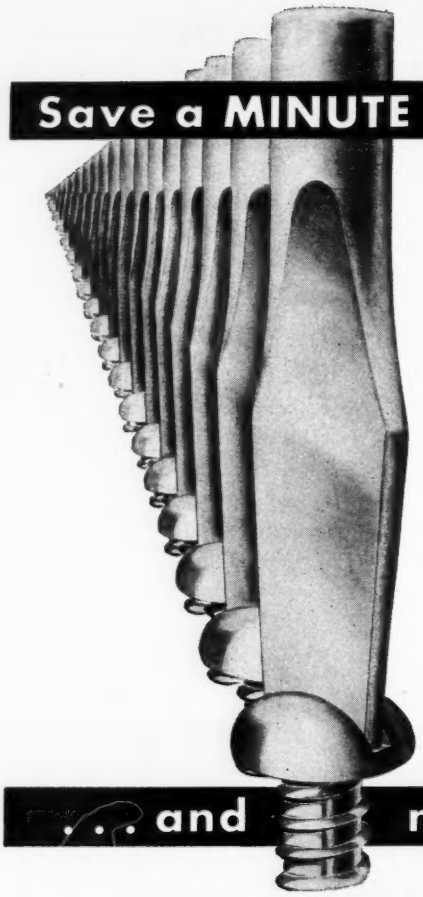
Badger, like many a manufacturer who is hard pressed for production during these critical days, has found the Warner & Swasey 5-Spindle Automatic an answer to a prayer. For in addition to improving work quality and stepping up production, it does this with fewer operators.

If these facts hit home, call in your nearest Warner & Swasey Field Representative. He'll be glad to help you boost your man-hour output.



WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES



Save a MINUTE . . .

here...

BOLTS, NUTS AND LOCK WASHERS

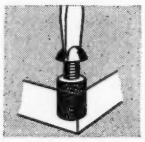
here...

MACHINE SCREW IN TAPPED HOLE

here...

RIVETING IN HARD-TO-REACH PLACES

here



MACHINE SCREW IN THREADED INSERT

. . . and multiply it by MILLIONS!

A simple idea — Self-tapping Screws — originated 35 years ago by Parker-Kalon — becomes more important to industry every day.

The idea is simple—hardened screws that will drive into metal or plastics just as wood screws drive into wood—to save the time and equipment required for tapping, riveting, and nut-running.

But its accomplishment is far from simple. The foundation of P-K leadership was its success in mastering the difficult problem of mass-producing screws possessing the proper balance of hardness and toughness. It is the reason the names Parker-Kalon and Self-tapping Screws are synonymous today.

IF IT'S P-K IT'S O.K.

Your savings with P-K Screws—at each fastening point—are measured in minutes or less. But these minutes—multiplied by millions of fastenings—mount rapidly. They *total* a big saving—a saving you can't afford to overlook with production demands soaring, production costs at an all-time high, and with a squeeze on profits.

Why not let a P-K Assembly Engineer help you to plan your DO, or other assemblies, in order to take full advantage of the *economical* Self-tapping method? Parker-Kalon Corporation, 200 Varick Street, New York 14, New York. Sold through Accredited Distributors.

The Original

PARKER-KALON® SELF-TAPPING SCREWS

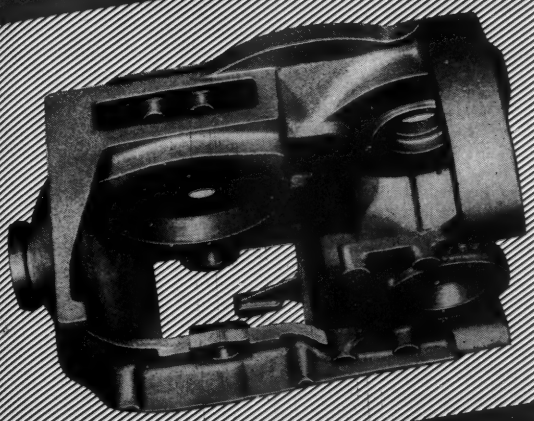
A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY

PROBLEM SPECIALISTS

DEALING IN YOUR PARTICULAR BRAND OF PRODUCTION PUZZLER!

F-C 85

OUR 41ST YEAR



SAMPLE PUZZLER

Problem—to design and manufacture in one strong, durable casting—a complicated part made up of an intricate assembly formerly welded from multiple steel parts—and to make it stronger, and more economically.

Decades of research in specialized light section castings has made startling advances possible. The production of complicated castings is an important part of the famous FARRELL-CHEEK One Point Service.

FARRELL'S LIGHT SECTION STEEL CASTINGS

A COMPLETE SERVICE IN ALL PHASES OF STEEL CASTINGS . . . STANDARD PARTS OR SPECIAL DESIGN . . . FARRELL-CHEEK HAS THE EXPERIENCE AND SKILLS WHICH ASSURE YOU OF GETTING WHAT YOU WANT.

FARRELL-CHEEK STEEL COMPANY

MANUFACTURERS OF HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

FARRELL'S CARBON STEEL CASTINGS
FARRELL'S HARD EDGE STEEL CASTINGS
FARRELL'S "85" STEEL CASTINGS

RAILROAD CASTINGS
Locomotive and Car
R. R. Specialty Castings.

ELEVATOR, CONVEYOR PARTS
Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers.

BUSHINGS
Carbon and Alloy Steels Machined, Hardened and Ground.

CRANE WHEELS

GEARS AND PINIONS
"True Tooth" Gears and Pinions, Sheaves and Wheels.

SPECIALIZED CASTINGS
Light Section Castings.

STOKER PARTS
Feed Screws, Furnace Tools, Flanged Pipe, etc.

HEAVY HARDWARE
Wire Rope Fittings, Choker Hooks, Bar Benders, Cutters.

YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS.

FARRELL-CHEEK STEEL CO., Sandusky, Ohio

the magnet that answers THE NEED

Dings New Improved Lifting Magnet . . . Weighs Less, Lifts More, and Lasts Longer

THIS latest Dings magnet has *all* the features necessary for maximum scrap yard performance. A few examples . . .

WELDED STEEL CONSTRUCTION—eliminates the moisture danger, makes a strong rigid magnet that can take the hard blows.

LIGHTER WEIGHT—*More* of the weight your crane is carrying will be payload. A balanced magnetic circuit of advanced design makes this difference.

MAXIMUM POWER, LONGER—No. 1 reason for this is less heat rise due to the improved magnetic circuit. In addition, a new, finer insulating compound dissipates strength-sapping heat, prevents electrical leakage between coil wires.

Those are the *big* new features. There are a dozen other important ones you'll be interested in.

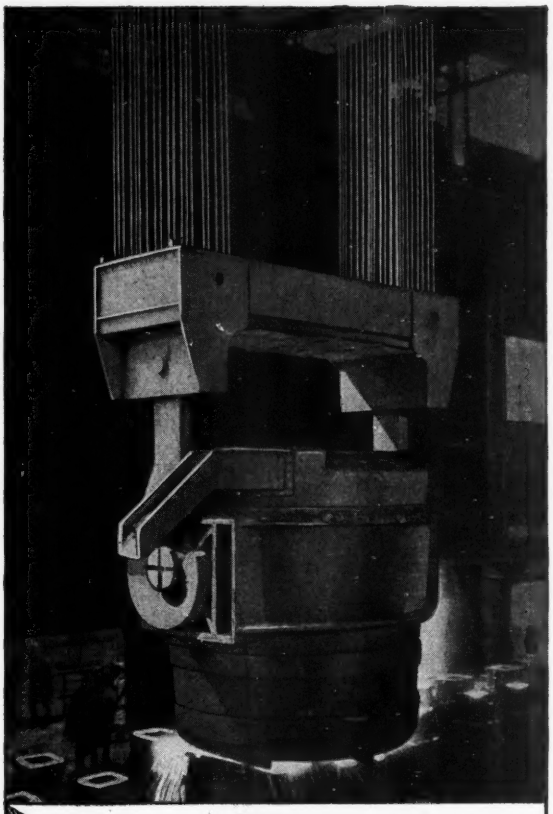
FOR FULL DETAILS, WRITE for the LIFTING MAGNET CATALOG.

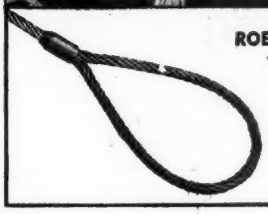
DINGS MAGNETIC SEPARATOR CO.

4710 W. Electric Ave., Milwaukee 46, Wis.

Dings Certified MAGNETIC STRENGTH

WIRE ROPE





ROEBLING ALL-PURPOSE SLINGS with the Tapered Sleeve Splice come to you ready for the job. They cost less than tucked splices... have the full strength of the rope. Send for the full story.

Roebling "Blue Center" Preformed works better . . . lasts longer . . . cuts costs

"BLUE CENTER" STEEL wire rope is an exclusive Roebling development. Its high resistance to abrasion, shock and fatigue spells long life. In addition, Roebling Preforming gives you a rope that is easy to handle . . . has better spooling qualities . . . reduces vibration and whipping. This combination makes Preformed "Blue Center" Steel Wire Rope a top performer on the job.

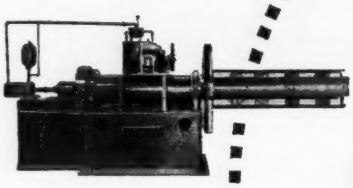
Roebling makes a complete line of wire rope . . . there's a construction for every installation. Have your Roebling Field Man help choose the *right* rope for your equipment. Get his advice on the correct use and maintenance of wire rope. It is based on performance records on thousands of installations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

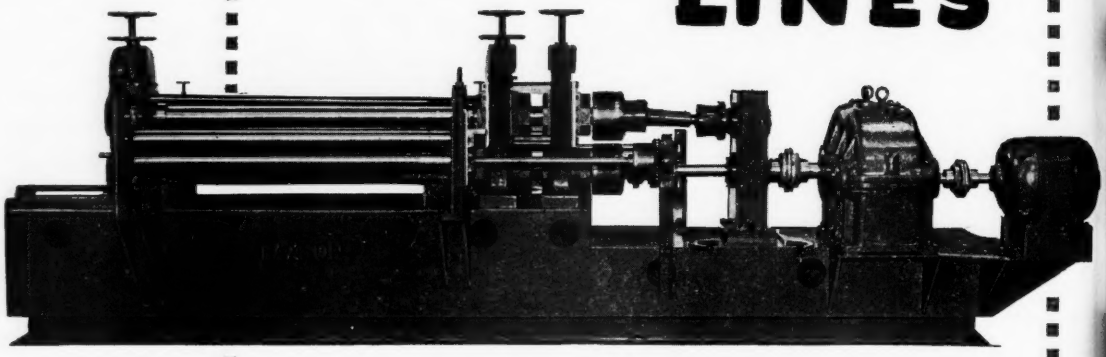
Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St ★ Export Sales Office, ***Trenton, N. J.***

PAXSON GIVES YOU THE EDGE

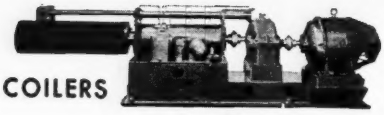
HEAVY-DUTY *Slitting* LINES



PAY-OFF REELS



SLITTERS



COILERS

STRAIGHTENERS
SCRAP WINDERS
SCRAP CHOPPERS

Complete PAXSON lines are setting performance records—*coast to coast*

Paxson Slitters are proving their efficiency for the toughest jobs, such as cutting heavy wall tubing stock and other heavy-duty slitting. Capacities up to 30,000 lb. coils. Various power, to meet requirements up to 1½" total metal thickness. Paxson also builds general duty lines.

Whatever your slitting requirements—contact Paxson.

Do You Fly?

2800 ft. E.W. runway and club house, private field 2 miles west of Salem, maintained for your convenience. Wire or phone arrival time. We will meet your plane.

PAXSON MACHINE CO.

SALEM • OHIO

Engineers and Builders of Cold-Rolled Strip-Mill Equipment

SPECIALIZING IN SLITTING LINES

REMEMBER, ALL PAXSON LINES ARE CUSTOM BUILT

Weather the storm with walls of steel

Metal sculpture, executed in Weirzin steel, demonstrates the exceptional workability of this easily fabricated metal.

Let them frolic, let them splash—no damage done. Not when your walls are safeguarded with sparkling, *water-safe* tiles of steel.

Like the other steel equipment in this bathroom—light fixtures, shower curtain rod, medicine cabinet, for instance—steel tile is decorative as well as durable . . . low in price and high in practicality.

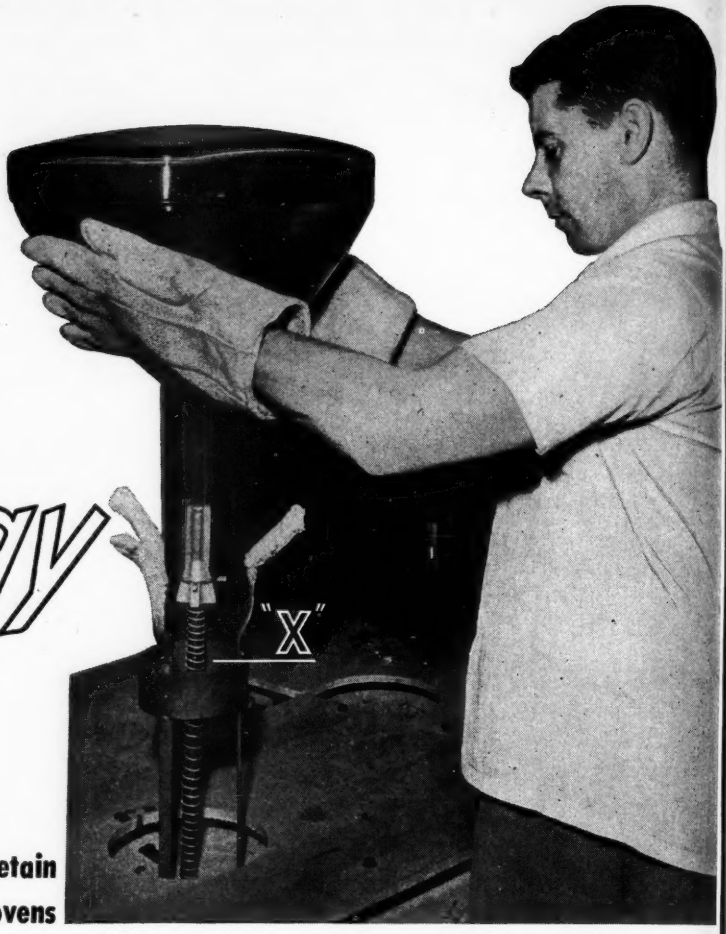
That's because it *is* steel—America's most useful metal, America's greatest bargain metal. More than that, it is made of a steel particularly suited for the purpose—*Weirzin*, the electrolytically zinc-coated steel that resists heat, moisture, rust . . . that provides a wonderful base for paint . . . that protects the beauty it adds.

Steel is one of the most reasonable things you can buy . . . one of the greatest values you can obtain for your money. It's good business to make steel your standard—and save.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

Springs that stay Springy ...up to 750° F.



Inconel "X" springs retain properties in high-temperature ovens

This view shows how the tube is placed on the spider which is held in place by an Inconel "X" spring. Designed for Federal Telephone and Radio Corp., Clifton, N. J.

High temperatures take the life out of most springs . . .

Trutner and Boumans, Inc., Hillside, N. J., had just such a problem.

They had designed a new type of television tube screen baker for driving off moisture and volatiles on the fluorescent screens. The baker carried the tubes through a gas-heated circular oven which gradually reached a temperature of 750°F.

Their problem was to find a spring material that would stand the high temperatures and exert just the right pressure (3 to 4 pounds) to hold the spider guide fitting in the neck of the tube.

They brought their problem to INCO...

INCO spring specialists studied the design specifications and then recommended .042" Inconel "X" wire.

Inconel "X" is one of the new superalloys developed for use in jet planes and other high temperature applications . . . a heat resisting alloy of nickel and chromium that can be age-hardened to get high hot-strength and hardness.

The oven has now been operating round-the-clock, 24 hours a day for over ten months. And there has not been a single spring failure.

Like Trutner and Boumans, many other manufacturers have found that both high- and low-heat problems can be solved dependably with the versatile INCO Nickel Alloys. Each of these individualized metals offers special advantages in addition to remarkable resistance to corrosion and destructive oxidation.

Right now you may find the INCO Nickel Alloy you need is hard to get. That's because so much of INCO's production is being diverted to defense. But, if you have a special metal problem, INCO's engineers will be glad to study it and make suggestions.

MONEL® • "R"® MONEL • "K"® MONEL
"KR"® MONEL • "S"® MONEL • NICKEL
LOW CARBON NICKEL • DURANICKEL®
INCONEL® • INCONEL "X"®

INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Between Two Fires

Mr. Truman's midyear economic report (p. 53) presented defense production estimates for the coming 12 months as though they were beefed up from original plans. Actually the program the President described is much the same as the one outlined and publicized months ago. His odd approach was designed to meet two conflicting objectives: On the one hand, forestall any possibility of a defense letdown in case of peace in Korea, and, incidentally, try to force action in Congress for a stronger controls bill; on the other hand, be able to soothe the large bloc of voters who want less defense preparations by pointing out, if the need arises, that present defense plans are no stiffer than the program outlined months ago.

Steel in Hiding

Gray market steel activities are not yet serious, but there are substantial tonnages of the metal "in hiding." Not uncommon are cases such as Chrysler's. The company got steel allocated and delivered to its new Newark, Del., tank plant, but the facility isn't even built yet. The material is reportedly lying in a Delaware warehouse until the plant is finished. Evidence is also mounting (p. 35) that the Washington planners have overallocated to some consumers who are sitting on the material.

Troubles in Expansion

Watch for a Congressional blowup about defense plant expansion, particularly by auto companies. The Senate Small Business Committee may set off the explosion. It asks: Why are the auto people expanding when Detroit layoffs at the established plants are increasing? One answer: It is quicker and more economical for the car makers to build new plants than re-equip the old for defense production.

Civilian Goods Employment Slips

An employment trend that showed up in the 30 days from May 15 to June 15 will accelerate over the coming months. Consumer goods employment dropped, but was not quite offset by gains in defense industries. Nonfarm employment rose slightly over the month, to 46.4 million, only because of seasonal increasing in construction and food processing. June, 1950, employment has risen by 190,000 in aircraft, 80,000 in machinery and 50,000 in private shipyards.

Congress Raises Eyebrows

Expect Congress to take another look at the V-loan program, the Air Force's device to assist business in converting to defense production. Congress will charge that 90 per cent of the loans thus far

Production-Engineering News—p. 63 The Market Outlook—p. 107

granted have gone to companies employing more than 500 people. The legislators are unhappy because the loan program was sold to them as a means of aiding small business.

GSA Spurs Minerals Production

General Services Administration, under a long-term program established by the Munitions Board, has contracted with mining and quarrying firms to increase production of five minerals—bauxite and quartz from going sources, metallurgical manganese, monazite (a rare earth) and tungsten from new sources.

Scrap in Korea

A government-sponsored commission will leave for Korea about the middle of August to determine the quantity of battlefield scrap available for shipment to this country and to make necessary recommendations concerning collection and handling. Representatives of U.S. Steel, Bethlehem and Kaiser, all with plants on the Pacific coast, and one or two scrap trade men will comprise the group. More than 200,000 tons of scrap may be available to the U.S. An estimated 1 million tons is available in the Orient, much of it on Pacific Islands from World War II days (STEEL, July 23, p. 37).

Interlocking Directorates

The bill (S.1659) sponsored by Sen. Hubert H. Humphrey (Dem., Minn.) that would prohibit multiple directorships in large corporations may set off fireworks. The senator says the measure's impact would be confined to only about 200 manufacturing and mining corporations and 25 retail firms. American Institute of Management, New York, says: "Government surveys show that interlocking directorates are held by 10,000 persons in 16,000 leading corporations."

Straws in the Wind

Osborn Mfg. Co. is developing a brushing method for removing and salvaging cooling scale from the surfaces of steel strip, bars and rods . . . The pressed stamping industry wants to get out from under CPR 30 and get a special pricing order modeled after the special World War II regulation . . . The open-top freight car shortage may become desperate by fall and winter . . . OPS will permit sales at 27½ cents per pound, Connecticut Valley, for electrolytic copper made from foreign ore; the price of copper made from domestic ore, 24½ cents, remains unchanged.

What Industry Is Doing

Columbia Steel Co. hopes to have its Pittsburg, Calif., expansion finished next April (p. 35) . . . Sales of mechanical rubber goods have lost some of their bounce (p. 37) . . . Three developments may spur commercial use of titanium (p. 37) . . . Machine tool shipments in June were the highest since January, 1944 (p. 38) . . . Foreign tool production is increasing (p. 45) . . . U.S. tool builders are unhappy with General Overriding Regulation 15 which was supposed to solve their pricing problems (p. 46).

YES, IT'S *Yoloy*

For a LIGHTER, TOUGHER STRONGER Fire Ladder

QUALITY YOUNGSTOWN SERVICE

SEAGRAVE builds the ladder of its fire truck entirely of Yoloy because this high-tensile, low-alloy, nickel-copper steel is extra strong and durable. Yoloy permits lighter, more rigid construction, making possible smoother hydraulic operation of the ladder. Also, with so much dead weight eliminated, operation is faster.

Yoloy stands the abuse of extreme temperatures and shock, as well as resists corrosion and abrasion. It helps reduce maintenance and extends equipment life.

Let our representative tell you how you, too, can use Yoloy profitably in your products.

Truck and ladder fabricated by The Seagrave Corp., Columbus, Ohio; Yoloy tubing for ladder furnished by Van Huffel Tube Corp., Warren, Ohio.

Youngstown

YOLOY STEEL

THE YOUNGSTOWN SHEET AND TUBE COMPANY

General Offices — Youngstown 1, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel

Export Office - 500 Fifth Avenue, New York

SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES - CONDUIT - PIPE AND TUBULAR PRODUCTS - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS.

There's An Atom Bomb In This Headline

Донт Тирн Уоир Скрап Ін!

—It could sabotage our whole defense effort, disrupt our civilian economy and nullify our steel expansion program. In the Russian alphabet it spells:

"Don't Turn Your Scrap In!"

In this light, those who fail to turn in theirs are unwittingly but none the less effectively giving "aid and comfort" to those who would destroy us.

This is not just so much "scare" talk

Turn Your Scrap IN— Help Turn More Steel OUT

There's no denying that open hearth scrap inventories are dangerously low. Supplies normally sufficient for 60 to 90 days, range now from a few weeks to as little as two or three days. Any further shrinkage, even slight, could shut down some furnaces completely and badly cripple over-all steel production.

Have you made a thorough search for dormant scrap in and about your plant? Ferret out every piece. Sell it *today*. Every extra ton will help sustain steel output and safeguard defense and civilian production objectives.

What's more, like the bread cast upon the waters, your scrap will come back to you in more steel and more steel components to keep your own business going.

DSC

DETROIT STEEL CORPORATION

DETROIT 9, MICHIGAN

PORTSMOUTH DIVISION, Portsmouth, Ohio
DETROIT and EASTERN MILL DIVISIONS, Detroit, Mich. and New Haven, Conn.
RELIANCE STEEL DIVISION, Chicago, Cleveland, Detroit, New Haven
CRAINE-SCHRAGE STEEL DIVISION, Detroit, Mich.

Broader Base

Without fanfare, electric steelmaking has advanced to second place among steelmaking processes. Output of electric steel exceeded that of bessemer for the first time in 1948, fell behind in 1949, regained the lead in 1950 and is far ahead in 1951.

This ascendancy of electric steel reflects the constant shift among steelmaking processes that has been going on ever since steel replaced iron. Late in the nineteenth century bessemer steel was first, open-hearth steel was second and crucible a poor third. Bessemer rose to its peak year of 13,748,930 net tons in 1906 and crucible climbed to its pinnacle of 146,982 net tons in 1907. Bessemer has declined steadily since then, except for a moderate revival in recent years. Crucible tonnage faded to the point that its output is ignored by official statistics.

Meanwhile, open-hearth steel was gaining rapidly. It overtook bessemer in 1908 and its margin has increased steadily until in the first half of 1951, open-hearth steel was produced at an annual rate of 92,875,100 net tons, against 4,741,770 tons for bessemer. During the first half, electric steel output was at the annual rate of 6,929,016 net tons—an excess of 2,187,246 tons over bessemer, or 46 per cent.

The rapid gain in electric steel is significant. One salutary aspect is that it provides hope for nonintegrated steel operations. For years we have heard people say that the steel business is open only to those who have unlimited financial resources and that the day of the nonintegrated company has passed. Some individuals never have accepted this death sentence. Scores have written that there must be some way for the competent operator with limited finances to enter the steel industry. Many of them base this hope upon the flexibility of the electric furnace.

Economic conditions of the day lend strong support to this line of reasoning. The acute need for steel encourages the quick expansion offered by the electric furnace. If this results in a healthy, sound diffusion of steel capacity among nonintegrated units, widely distributed geographically, so much the better.

E. C. Shaner

EDITOR-IN-CHIEF

CMP IS IN TROUBLE: National Production Authority's Controlled Materials Plan, upon which steel consumers were relying in the hope that it would provide a more equitable distribution of finished steel, is off to a bad start. Increasing numbers of buyers holding CMP tickets cannot cash them. Mills which already have allocated all of their September ton-

nage are forced to turn down CMP tickets right and left.

This would indicate that something is radically wrong. NPA officials not only are adopting drastic measures in attempts to relieve the September situation, but they also are trying to find out what went wrong so that the mistakes will not be repeated in the handling of rated orders and CMP tickets for fourth-quarter steel.

Distributing steel under present conditions is admittedly complicated, but there is little excuse for issuing tickets for more steel than is available. For their own protection and in justice to steel buyers, NPA officials should not rest until they have found the root of the trouble and have corrected it. —p. 35

* * *

RED TAPE UNLIMITED: For many years, the metalworking industry has relied upon certain statistics put out by the Department of Commerce and in the main they have been fairly accurate and have been made available promptly. Today these reports are coming out several months late. This reduces their value considerably.

Why this breakdown? It is due largely to the fact that the government in its pyramiding of agencies dealing with mobilization, is questionnairing industrial companies to the limit. The over-taxed office forces of the nation's manufacturing establishments are so busy providing answers to endless bureaucratic questions that the replies to normal statistical requests have to be sidetracked. We wonder how much of the requested information would be declared useless and unnecessary if a competent over-all supervisory authority were in charge of the government's bureaucracy. —p. 42

* * *

DOWN FROM YEAR AGO: For the first time since March, 1950, this publication's index of industrial production has failed to exceed the level of the corresponding period a year ago. This has occurred in two consecutive weeks. In the week ended July 14, the index stood at 206 per cent of the 1936-1939 average, compared with 209 in the corresponding week of 1950. In the week ended July 21, the 1951 figure was 211 against 214 in the 1950 week.

Unfavorable comparisons with figures for a year ago are likely to continue. The index is based upon four factors—steelworks operations, electric power output, freight car loadings and automobile assemblies. Government restrictions are holding automobile output to lower levels. Freight car loadings are off slightly from a year ago. Electric power output and steel operations, while at extremely high levels, henceforth will be competing with the sharply rising activity of the midsummer weeks last year which followed the attack on South Korea. —p. 53

* * *

FUTURE NOT TOO BAD: Mechanical rubber has become a full-fledged, important industry. It consists of about 500 companies, which up to a month ago were producing at a rate slightly above the very satisfactory pace of 1950. In recent weeks the industry's outlook has been clouded by the receding demand for mechanical rubber goods by the consumer goods industries.

This decline will be offset in part by the rising consumption for defense requirements. The military needs flexible gas tanks, tank track blocks, bushings, hydraulic and other types of hose for aircraft, de-icers for aircraft and automotive products adaptable for military use.

Important is the fact that 900,000 tons of synthetic rubber is being produced monthly against 300,000 to 400,000 tons a year ago. Release of a fraction of the government's stockpile of natural rubber would help the rubber people. —p. 37

* * *

CERAMICS AND STEEL: During the past several years the literature of the metalworking industries has touched occasionally upon the possibility that ceramics bonded with steel may be one answer to the problem of providing components that will stand up to high temperature punishment in jet engines. The United States Bureau of Standards has conducted valuable research in this direction and a few manufacturers have worked hard on the problem.

One of the latter—Solar Aircraft Co.—has developed a process of dipping conventional stainless steels into a ceramic frit and firing them at 1300-2400° F. The resultant ceramic-coated component will withstand temperatures of 1800° F. Probably more important is the fact that this procedure permits the use of conventional stainless steels instead of alloys containing large percentages of critical nickel, chromium, cobalt and tungsten. —p. 66

NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1951

HOW ECONOMIES OF WELDED STEEL CUT YOUR PRODUCTION COSTS

WHEN designs utilize the economies of welded steel construction, invariably costs are less. That's because fewer pounds of less costly material are needed . . . Each pound of metal can be more easily concentrated where it does the most good.

Wherever costs are higher, inevitably the designs have fallen short of embodying the potential savings, or the products themselves have been overdesigned. A careful reappraisal by the shop before a design is "frozen" simplifies construction details and eliminates every unnecessary expense for lowest cost of manufacture.

Your Lincoln Welding Engineer will gladly help you analyze your designs and point out various cost reduction possibilities. Simply call or write.

Fig. 3. Saves 51% Cost *by forming lever arm and pad as integral piece from 10 gauge metal. Weighs 2.5 pounds . . . costs 54¢.*

Fig. 4. Saves 67%, Eliminates Broaching. *Hub with integral key is produced by stacking stampings in assembly. Arm is 10 gauge, brake formed and welded to hub. Cost is only 31¢ . . . weight 2.2 pounds.*

the ACTUAL

Fig. 1. Traditional Construction. *Machine foot-lever, 10 inches long, weighs 6 pounds. Cost with broached keyway is $1.15.*

increasing the YIELD

Fig. 2. Simple Steel Design Costs 34% Less. *Can be built by the shop with only saw and shears. Weighs 2.7 pounds . . . costs 68¢ complete with keyway.*

the IMMENSITY of the POSSIBLE

Unlimited opportunities to create efficient, lower cost designs.

SEE HOW STEEL BUILDS IT WITH LESS MATERIAL

Machine Design Sheets are available to designers and engineers. Simply write on your letterhead to Dept. 168.

THE LINCOLN ELECTRIC COMPANY

CLEVELAND 1, OHIO

Don't Scrap PROFITS— from Scrap!

Today your DORMANT SCRAP* means more steel to help meet all-time high defense and domestic demands. Your country NEEDS it!

Today your DORMANT SCRAP* commands high prices.

HOW TO TURN SCRAP INTO MONEY...

with an organized dormant-scrap round-up in your plant:

1. Appoint a top executive with authority to make decisions to head the salvage drive.
2. Organize a Salvage Committee and include a member from every department.
3. Survey and resurvey your plant for untapped sources of dormant scrap. Encourage your employees to look for miscellaneous scrap and report it to the committee.
4. Sell your entire organization on the need to scrap unusable material and equipment.
5. Prepare a complete inventory of idle material and equipment. Tag everything not in use.
6. Start it back to the steel mills by selling it to your regular scrap dealer.
7. **KEEP AT IT!**

* Your DORMANT SCRAP is any obsolete, broken or wornout and irreparable machinery, tools, equipment, dies, jigs or fixtures, etc., that may encumber your premises. These, in the language of steel, are *scrap*, vital to steel production, and hence convertible into cash.

Steel is normally made from scrap and new pig iron in about a 50-50 ratio. The use of scrap means *better* steel, *faster* . . . because scrap has already undergone one refining process. Today under pressure of domestic and defense demands, the steel industry is consuming purchased scrap at the rate of 100,000 tons per day . . . an all-time high. *Your* dormant iron and steel scrap is *urgently* needed.

Round-up and sale of your dormant scrap NOW will benefit you, all steel users, and our country by:

1. Keeping the steel furnaces producing at their highest rate in history.
2. Conserving our vital iron ore reserves. The *more* scrap used in steelmaking, the *less* ore needed.
3. Making *better* steel, *faster*.

INLAND

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

CMP Gets Off on the Wrong Foot

NPA allotted too much steel in September and many users can't cash their CMP tickets. Officials are hunting the error so fourth quarter allocations will be correct

THE CONTROLLED MATERIALS Plan is off to a bad start.

Large numbers of consumers all over the country report they can't cash in their CMP steel tickets for September because the mills are already booked up. National Production Authority officials in charge of CMP admit that something's radically wrong. Mills are turning down CMP tonnage right and left and telling consumers to try some other producer.

Stop-Gap—As a last-minute measure to try to bring some order to the chaos in September steel distribution, NPA last Wednesday instructed all steel mills to increase set-asides of their September production of certain carbon steel products for rated orders. The products are reinforcing bars, nails and staples, barbed and twisted wire, wire fence and wire net, on which set-asides for rated orders are now 95 per cent. That compares with the present percentage of 70 per cent in reinforcing bars, 90 per cent on nails, staples, barbed and twisted wire fence and 75 per cent on wire net. Set-asides for rated orders also have been increased for stainless steel—to 100 per cent from 75 per cent on ingots, to 90 from 50 on blooms, slabs and billets, to 100 from 75 on sheet bars and to 100 from 50 on hot-rolled strip.

NPA officials are also busy on a scheme to stretch out the supply for rated orders by making an across-the-board slash in all CMP allotments for September except direct military. Announcement of such a cut may come out momentarily.

Too Late—Actually those measures for the September allotments will come too late for any far-reaching relief. The stark fact is that those consumers who got their CMP tickets late and thus found the steel mill books already closed for September are out of luck as far as steel for that month is concerned. Many plants may have to shut down all or part of the month with enforced vacations for thousands of employees.

NPA people are working now to figure out what went wrong in the September allotments, so they can correct the error by the time the fourth-quarter allocations are fixed,

NPA IN A QUANDARY
. . . something's radically wrong

a job originally scheduled to be completed by Aug. 16.

Up in the Air—Also uncertain is the fate of the "free" steel which was supposed to amount to 15 per cent of total September production. NPA still wants to leave that proportion untouched, but its tinkering with the set-asides for the month are bound to cut into free material. Thus far, no unusual complaints have come from consumers who must rely on that free metal.

The irony is that some users with unhonored CMP tickets can't buy the free metal. Many of them are large consumers whose requests took a long time for processing in Washington. As a result, they were late in presenting their allocations to steel companies who took the rated orders on a first-come first-served basis.

Inland Reports on Conversion

Conversion business comprised 14 per cent of Inland Steel Co.'s total mill shipments of steel during the second quarter of this year.

Present commitments indicate it will continue at about that rate during the current quarter.

During the first quarter, conversion reached a new high level with Inland and represented 16 per cent of its total mill shipments.

Under conversion arrangements, raw and semifinished steel supplied by customers is rolled into finished products for them.

Inland officials declined to predict how long the demand for steel will exceed supply. It is not possible, they say, to estimate to what extent current demand is induced by confusion from widespread governmental controls and the predictions from Washington of continuing scarcities.

Half Way on Expansion

Columbia Steel hopes to have its Pittsburg, Calif., project finished next April

COLUMBIA Steel Co., West Coast subsidiary of U. S. Steel Corp., has passed the half way mark in the construction and equipping of its second sheet and tin plate mill at its 400-acre plant site in Pittsburg, Calif.

Last of the equipment is expected to be installed by next April, J. D. McCall, general superintendent, told STEEL. He said this will be the continuous galvanizing line, which, he declared would be the first one of its kind west of Gary, Ind.

Up and Up—When completed, Columbia will have processing capacity for 350,000 tons of tin plate and 192,000 tons of steel sheets. At present the annual capacity is 200,000 tons of tin plate and 125,000 tons of sheets, the total of the two being cold rolled on one 56-inch, five-stand mill.

The second mill now being installed will be of four stands and will be devoted exclusively to the cold rolling of sheets, leaving the other mill free for processing tin plate. Besides the added capacity, the new mill will save time lost in switch-over procedure.

All in the Family—The hot-rolled steel coils are supplied to Columbia by Geneva Steel Co., another U. S. Steel subsidiary, in Provo, Utah, leaving Columbia's open-hearth furnaces and rolling equipment available for production of other steel products, including steel wire, nails, wire fencing and wire rope.

Considerable water seepage problems had to be licked before the foundation for the new buildings could be laid. The plant is near the bay and much of the hundreds of miles of conduit for lubrication, coolants and electrical wiring and complicated electrical systems and intricate machinery lay in tunnels and rooms far below sea level. Excavation levels run as much as 60 feet below the surface.

Columbia Gets Tramway Division

U. S. Steel's Columbia Steel Co. has established a tramway division,

the only one if its kind in the corporation.

It is in a position to bid all jobs completely erected as a prime contractor for projects anywhere in the U. S. Foreign projects will be bid through U. S. Steel Export Co. The tramway division was attached originally to Trenton Iron Co. and subsequently to the U. S. Steel subsidiary, American Steel & Wire Co.

Canada Places Defense Orders

Canada's Defence Production Department reported that orders totaling $60 million were awarded during June.

Among the larger orders placed were, $17,107,000 to Canadian Wright Ltd., Montreal, for aircraft engine repairs and modification; $4,883,000 to Chrysler Corp. of Canada Ltd., Windsor, for vehicles; $12,281,000 to General Motors Products of Canada Ltd., Oshawa, for vehicles and parts and $2,065,000 to Standard Aero Engines Ltd., Winnipeg, for aircraft engine repairs.

Houston: Rising Southwest Star

Gaining rapidly in the Southwest as a metalworking center is Houston: If sales of metal goods in the area continue to rise for the rest of the year as they have for the first six months, total sales will probably reach $400 million. And the payroll for the 28,400 persons in metal manufacturing may reach an alltime high of $100 million.

In 1947, when the last U. S. Census of Manufactures was released, Houston had 259 metalworking plants, employing 22,541 persons; today metropolitan Houston has 308.

GARY SHEET & TIN MILL
. . . five stories to annealing line

PROJECTION: This aerial photo shows the 38-acre plot on the Monongahela river at Allenport, Pa., where Pittsburgh Steel Co.'s new 66-inch, 4-high continuous strip mill will be built. Buildings that will house the mill are sketched in to show what the site will look like when completed next year

Continuous Annealing at Gary

Just placed into operation at the tin mill division of United States Steel Co.'s Gary, Ind., Sheet & Tin mill is a line that makes possible continuous annealing of steel for tin and black plate products. Plate in varying thickness—18 to 37 inches wide—can whip through the line at 1000 feet per minute.

Construction of the line started a year ago. It is housed in a new building 336 feet long; ceiling height is 76 feet. The furnace section, equipped with combination gas and electric heating units, is almost 64 feet above the plant floor.

To give tin plate the pliability necessary for forming into cans, the plate must be annealed (after cold reduction, tin plate is stiff and unyielding). The installation is part of the overall program started by U. S. Steel to increase the productive capacity of the Gary mill. It did. Rated capacity of the line is 136,000 tons annually.

Certificates for 114 Facilities

Certificates of necessity for accelerated tax amortization of 114 more new or expanded defense facilities were approved by the Defense Production Administration during the week of July 13-20. Amount eligible for rapid depreciation on those certificates is $229,015,498.

With this latest tabulation, rapid tax write-off has been authorized for a total of 2793 new or expanded facilities. Total amount of tax amortization certified on these facilities is $8,335,472,305.

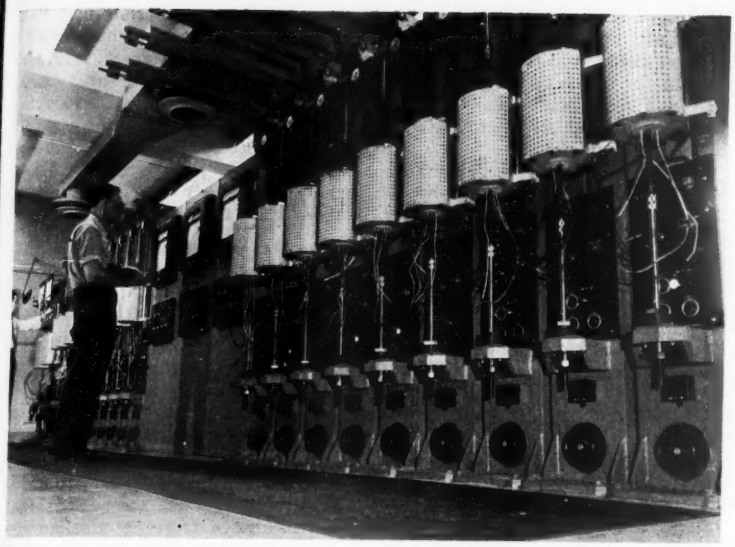
Emergency Loans Granted

Fifteen additional emergency loans totaling $9,806,378 for expansion of industrial facilities needed for the defense effort were authorized by the Defense Production Administration between May 28 and July 18.

These are in addition to 33 loans authorized between Dec. 18, 1950, and May 14, 1951. Total amount of all loans issued to date is $70,627,882.

Among companies in the latest list of loan recipients are: S. K. Wellman Co., Cleveland, $3.8 million; Tyson Bearing Corp., Massillon, O., $1,275,000; Stover Lock Nut & Machinery Corp., Easton, Pa., $349,000; C. G. S. Laboratories Inc., Stamford, Conn., $35,128; Schwien Engineering Co., Los Angeles, $398,500; Electronic Associates Inc., Long Beach, N. J., $150,000; Aircraft Products Co., Clifton Heights, Pa., $175,000; and Lucerne Coke Co., Indiana, Pa., $2,200,000.

VIEW OF FURNACE SECTION
. . . 64 feet in height



TESTING—THE WORKS: National Tube Co. spared little in setting up its new laboratory in Pittsburgh for testing materials and researching problems. The entire third floor of the three-story-and-basement building is for electronic measuring. Standard equipment is available for Vickers, Brinell and Rockwell hardness testing. Even mill safety hats and safety shoes can be tested in the lab. Here, 18 lever-type creep stands provide data for determination of elevated temperature properties of steels used in the manufacture of tubular products

Less Bounce in Rubber Goods Sales

Declining demand from manufacturers of consumer durables brings a slight lull, at a time when more synthetic rubber is becoming available

THE STRETCH is easing in hitherto tight supplies of mechanical rubber goods.

Two factors are taking the strain off manufacturers of the products for industry: Declining demand from makers of consumer durables and more synthetic rubber.

The Slack Comes—Up until a month or so ago, the 500 makers of mechanical rubber goods were producing at a rate slightly above 1950's fast pace. Demand was sustained because of rubber needs in the plant and equipment expansion program, because of the defense program which was taking about 10 per cent of the industry's production and because of the continued high output of refrigerators, automobiles and other consumer hard goods. The first two factors have shown little change, but the demand from consumer goods makers is softening like a deflating balloon.

Men in the industry expect the slack to continue for a while until defense volume expands, perhaps to 25 per cent of the industry's total sales by the end of the year. The major defense applications for mechanical rubber goods include flexible gas tanks, tank track blocks, bushings, hydraulic and other types of hose for aircraft, de-icers for aircraft and much of the range of civilian automotive products adapted for military use.

Synthetics to the Rescue—When defense requirements pick up, the industry will be able to handle fairly easily both the military and civilian work because of the rapidly increasing expansion in synthetic rubber production at Reconstruction Finance Corp.'s plants. Output now is actually higher than at any time during World War II, not because of any facility expansion but because of greater efficiency in production. Some 900,000 tons of synthetic rubber is being turned out a month now, compared to 300,000 to 400,000 tons monthly less than a year ago. Isolated companies don't have enough rubber yet, but the situation is much better than just a few months ago. There would be no trouble at all if the U. S. would release some of the natural rubber from its stockpiles.

Some 50 companies account for 85 per cent of all the business done in mechanical rubber goods. The industry offers about 30,000 different items, considering all the sizes and specifications. The rubber product whose sales account for the largest dollar volume is probably belting. Largest users of mechanical rubber goods include the automotive industry with its need for grommets, v-belting and various molded and extruded parts; the mining industry which uses large quantities of belting; and the oil and gas industry, the heaviest consumer of rubber hose.

Titanium in Triplicate

Three developments, all in the Cleveland area, spell greater commercial use of the metal

THREE CURRENT developments may make Cleveland a major titanium-producing center.

Chase Brass & Copper Inc. plans an $18 million expansion of two plants in Euclid, O., a Cleveland suburb, reportedly to roll titanium sheet and strip. Steel Improvement & Forge Co., Cleveland, will pioneer in commercial production of titanium forgings and has on its books orders amounting to more than $1 million for forged titanium parts. Newly formed in the city is Horizons Titanium Corp. which will produce the metal by a new, cheaper process.

Unconfirmed—Chase officials will neither confirm nor deny that they plan to roll titanium. Chase is a subsidiary of Kennecott Copper Corp. which also owns an interest in Quebec Iron & Titanium Corp. Quebec was formed in 1948 to develop titanium ore. The ore is already being shipped to a smelting plant at Sorel in Quebec. Finishing facilities in Cleveland to handle the smelted product make sense.

Despite the Cost—Steel Improvement will produce commercial titanium forgings in spite of the metal's high cost primarily because the forging is equal in strength to stainless steel but weighs little more than aluminum. Although Steel Improvement won't say so, the titanium forgings will probably be used in jet aircraft for the Air Force. Every jet engine requires from 2000 to 3000 parts where both extreme strength and high heat resistant qualities are required. Aluminum can't stand the heat, so stainless steel has been used freely up to now. The weight saving over steel offered by titanium forgings in military aircraft will mean more fuel for longer range.

New Method—The New Horizons Titanium Corp. hopes to do something about the cost of the light metal. Backed by Horizons Inc., an industrial research group, and Ferro Corp., Cleveland, the company will use a new production process developed by

Horizons (STEEL, July 9, p. 55). It wants to bring the cost of titanium down to $1 a pound from the present cost of $5 a pound for sponge and $7 a pound for ingot.

June Tool Output Rises

Machine tool shipments in the month hit the highest volume since January, 1944

MACHINE TOOL shipments, continuing to grow in June, reached their greatest volume since January, 1944, and helped make second-quarter shipments the largest since the first quarter of 1944.

Preliminary total of June shipments is 183.5 per cent of the average shipments of 1945-1946-1947, the National Machine Tool Builders' Association, Cleveland, reports. For May, the figure was 175.1.

New orders in June were up over May but did not equal those of February or March. In June, new orders were equal to 567 per cent of the shipments average for 1945-1946-1947. In May they were 483 per cent; in February, 615.5; and in March, 590.3.

But More Are Needed—Even though machine tool shipments are on the upgrade they must be increased sharply to meet anticipated needs of the mobilization program, the National Production Authority told the Machine Tool Manufacturers Industry Advisory Committee.

Meanwhile, the General Services Administration announced it is ready to make advances to machine tool manufacturers to assist them in the prompt performance of government machine tool pool orders. Advances up to 30 per cent of their pool orders will be made to manufacturers unable to obtain private financing on reasonable terms, without or with a government guarantee of the loan. Interest of 4 per cent a year will be charged.

Not Enough—Even if the machine tool industry is able to double its output in the next 12 months the increased production would still be inadequate to meet needs of the mobilization program, NPA said.

Industry spokesmen, pointing out that the industry's present capacity is about one-third of what it was at the start of World War II, emphasized that expansion of its productive capacity will require one or more of the following aids:

1. Super-priorities for materials, facilities and tools.

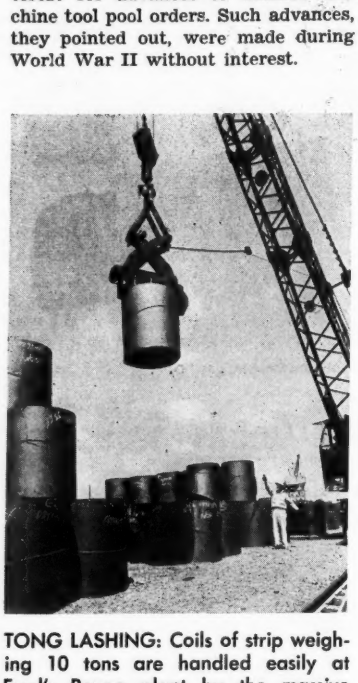
2. More skilled labor and assurances that war plants will not be permitted to "pirate" employees from machine tool plants.

3. Adequate financing to pay for expansion and provide greater working capital.

Don't Fill the Bill—The present certificates of necessity program is not adequate for machine tool builders, their industry advisory committee declared.

Some form of increased depreciation for tax purposes should be allowed also for plant equipment used in two and three-shift operation, they said.

The committee also criticized the government's charge of 4 per cent interest for advances to finance machine tool pool orders. Such advances, they pointed out, were made during World War II without interest.



TONG LASHING: Coils of strip weighing 10 tons are handled easily at Ford's Rouge plant by the massive tongs designed for the job by Heppenstall Co., Pittsburgh. Besides delicately handling the coils so as not to damage the edges, the tongs eliminate the need for a ground crew. Signalman in the picture merely spots the location for the craneman

Utilities Fear Short Circuit

Privately owned power companies fear a setback in their five-year continuing expansion to add a 50 per cent increase to their capacity unless manufacturers of electrical generating and transmission equipment are allocated enough steel, copper, aluminum and alloy metals to keep up with the construction plans of the industry, according to George M. Gadsby, president of Edison Electric Institute.

Mr. Gadsby, also president of Utah Power and Light Co., said in a San Francisco speaking engagement that the present government policy of allocating critical materials may hamstring the electric power industry's $15 million expansion program. This is the amount intended to be spent during the five years ended with 1954 and designed to bring generating capacity up to 100,500,000 kilowatts.

If the manufacturers do not get the materials, he won't guarantee there won't be a power shortage.

Alaskan Storehouse

The territory's rich resources could solve some of industry's raw material shortages

ALASKA'S untapped natural resources may be a partial answer to some of American industry's raw material shortages.

That's one of the conclusions that can be drawn from an Alaskan Resource Development report presented to Congress by Secretary of the Interior Oscar L. Chapman.

Rich—Alaska has deposits of mercury, chromite, platinum, tin, tungsten, zinc and antimony. There are possibilities for significant discoveries of oil and the territory contains deposits of building and construction materials to meet many of its own growing needs.

But Alaska, the report says, is richest in waterways which could produce about 50 billion kilowatt-hours of energy a year. The area's industrial future may flow from the development of hydroelectric power, costing less than 3 mills per kilowatt-hour. There are only a few undeveloped sites in the U. S. proper capable of generating energy at such low cost. That has resulted in light metal producers turning toward Canada. Alaskan hydroelectric development may tie in closely with contemplated industrial expansion in the adjoining northwestern regions of Canada. It's possible that a large portion of that Canadian area's mineral resources could be shipped to tidewater Alaskan plants for smelting, processing, manufacturing or marketing.

The Key—The report cites electric power as the key to the economic feasibility of extracting many of Alaska's minerals. The first federal power plant in Alaska is under construction at Eklutna Lake to provide energy for the Palmer and Anchorage areas. Reconnaissance studies in the territory indicate that there are at least 72 potential sites for generating plants in Alaska—for an installed capacity of 2.2 million kilowatts in the southeastern part of the territory, 3.3 million kilowatts in the south central region, 2.6 million in the Yukon-Kiskokwim area, 35,000 in the Sew-

ard Peninsula region and 225,000 in the Arctic area.

The report recommends that the federal government take "the responsibility to develop those resources."

Domestic Manganese Sought

Strained international relations between the United States and Russia have brought about another move by the U. S. government to obtain manganese to make up for the loss of supplies from the Iron Curtain area.

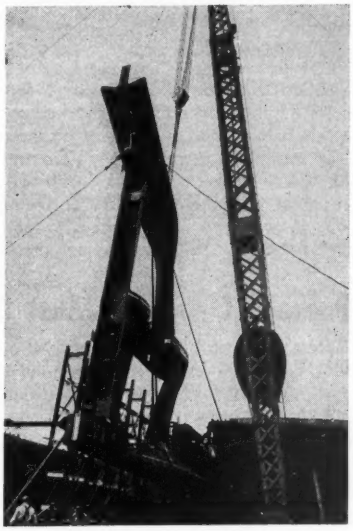
The General Services Administration says it will carry out a five-year domestic manganese purchasing program to encourage the discovery, development and production of manganese in this country. Under the program the government will buy manganese ore from miners at three depots being set up by GSA at Butte and Philipsburg, Mont., and Deming, N. Mex.

Progress Report on Lake Boats

A major step in the progress of two new giant ore carriers—the placing of 96,000-pound stern frames—is reported by W. C. Hemingway, president of Pittsburgh Steamship Co., ore-carrying subsidiary of U. S. Steel Corp.

The towering pieces of steel framework were set in position at the Lorain, O., yards of American Ship Building Co., builder of the vessels. A similar point in construction progress will be reached shortly at the Detroit yards of Great Lakes Engineering Works where the third of three new 647-foot boats is being built for addition to the Pittsburgh Steamship fleet of 61 vessels. All are scheduled for launching this fall and for delivery in time to start hauling ore from upper lake ports to furnaces at lower lake ports at the start of the 1952 shipping season.

Hull structure for the first boat being built at Lorain (the keel was laid Dec. 18, 1950) is about 65 per cent completed. The other two hulls, on which work started some weeks later, are 50 and 45 per cent completed. Besides the three ore carriers, a new limestone carrier—a 666-foot self-unloader—is being built at Manitowoc, Wis., for Bradley Transportation Co., another U. S. Steel subsidiary.



96,000-POUND STERN FRAME
. . . progress at Lorain, O.

Subcontract Clinics: More Business for Small Business

AS A BUSINESSLIKE means of getting prime and subcontractors together, the simple yet functional exhibitors' booths set up at the Cleveland Central Armory last week for the Armed Forces Procurement Clinic was a top-drawer idea. Engineers and purchasing executives present in all of the booths were able to figure and quote on jobs on-the-spot. And they did. For many subcontractors the groundwork was laid for contracts in the near future.

Over 80 important contractors in the Ohio-Indiana-Michigan-Kentucky orbit had booths. There they displayed hundreds of actual parts and subassemblies and thousands of blueprint specifications that they wanted to subcontract to qualified businesses. Components ranged all the way from microscopic parts for electronic instruments to massive castings and forgings for tanks, big guns, aircraft landing gear and ships.

Avowed Purpose—"More Business for Small Business" was the purpose of the clinic. And the more than 1500 potential subcontractors who milled around in the armory each of the four days (July 24 to 27) that the the clinic was being conducted got some of the business. Smaller operators with graphic proof of their facilities and abilities were able to tuck jobs away right at the clinic.

Subcontract clinics are by no means over. Another one will be held in Pittsburgh Aug. 15 to 17 at Hotel William Penn. Again, representatives of the Army, Navy and Air Force will sponsor the get-together. Admiral Ben Moreell, president and chairman of the board, Jones & Laughlin Steel Corp., will be chairman of the advisory committee. In Cleveland, for last week's clinic Robert A. Weaver of Ferro Corp., Cleveland, was honorary chairman.

Still other clinics on the immediate schedule: In St. Louis, at Kiel Auditorium, July 30 to Aug. 3; in Atlanta, at the Biltmore Auditorium, Sept. 10 to 12; in Los Angeles, at Hollywood Turf Club, Sept. 18 to 21.

Blast Furnaces Exceed Capacity

June was the second consecutive month that blast furnace production in the United States exceeded 100 per cent of capacity. June's rate was 100.2 per cent; the May rate was 100.3 per cent.

Because June has one less day than some of the earlier months of the year the production that month was not as great tonnagewise as that of some of the other months. In June, pig iron output was 5,919,735 net tons and yield of ferromanganese and spiegel was 57,921 tons making a total blast furnace production of 5,977,656 net tons, the American Iron and Steel Institute reports.

More Benefits for Steel Workers

Social insurance benefits to employees of U. S. Steel Corp. are being expanded by an estimated $4 million annually in agreements being concluded with the CIO United Steelworkers.

Unpublicized negotiations between the corporation and the union have been going on for months within the framework of their present insurance and pension agreement. The added benefits—surgical—will be added to the present life, accident and sickness insurance for employees and hospitalization benefits for employees and dependents at no extra cost to the employer or employee. The first year's experience under the program developed a surplus and the negotiators determined that additional benefits could be provided.

Reserves now are said to total about $8 million, twice the amount deemed to be the minimum. About 220,000 employees now are covered by the U. S. Steel-CIO social insurance program.

Alcoa Plans New Smelting Plant

A new aluminum smelting plant, the first in history to use lignite for fuel is planned by Aluminum Co. of America. Alcoa applied to the Interior Department for a certificate of necessity to build the plant soon at one of several alternate locations about 60 miles south of Waco, Tex.

The plant, which will have a pro-

duction capacity of 85,000 tons of aluminum annually, is expected to start operating early in the fall of 1952.

Opportunities Galore

New opportunities for companies wanting to add to their product lines continue to be presented in volume in the "Register of Patents Available for Licensing or Sale." They appear in each issue of the Patent Office's *Official Gazette*. The issue of June 23 had a list of 89 General Electric Co. patents on electric washing machines and ironing machines, and parts and controls for same. Also listed were a new chucking device for lathes, a nut pickup device, a heat retaining curtain. The July 3 issue listed 26 Atomic Energy Commission patents now available for licensing; three cutting-tool patents of GE's Carboloy Department; two furnace patents of Salem Engineering Co., Salem, O.; and 304 miscellaneous patents owned by General Electric Co.

Memo to Purchasing Agents

Purchasing agents, unlike domestic consumers, are subject to sanctions under the Defense Production Act of 1950 unless acting in good faith.

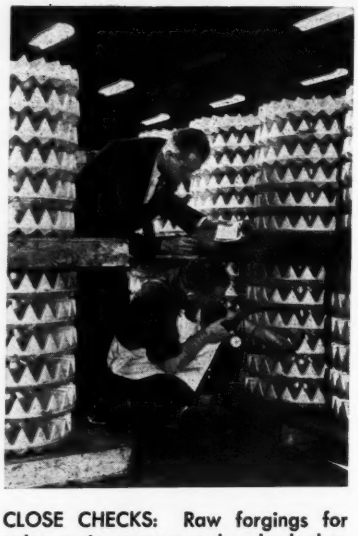
So says Harold Leventhal, chief counsel of the Office of Price Stabilization, writing in the National Association of Purchasing Agents' *Bulletin*. "The act," he writes, "is specifically made applicable, in terms of prohibitions, to any person who purchases, in the course of trade or business, in violation of the regulations. The buyer is not subject to the treble damage provisions, but he is subject to the other sanctions of the act, from injunction suits to criminal prosecution in cases of wilful violations."

RFC OK's 3 Loans, Vetoes 43

Reconstruction Finance Corp. becomes more selective each week in granting loans to business. In the week ended July 11, the lending agency approved three, amounting to $1,950,000, but turned down 45 other applicants who would have borrowed $2,556,201.

The small number of loans reported reflects the change in procedure that shifted lending authority from field offices to Washington headquarters on all loans. Only eight applications have been approved since this policy went into effect June 27.

Heckethorn Mfg. & Supply Co., Littleton, Colo., got the week's biggest grant of $1.5 million. Other loans went to Ward Body Works Inc., Denver, $100,000; and to Jayval Mfg. Co., Conway, Ark., $150,000.



CLOSE CHECKS: Raw forgings for a jet engine part must be checked to within a tolerance of 0.001 of an inch —or the piece is rejected. Here an Air Force inspector checks with an inspector of Allison Division of General Motors who uses calipers to get the precise measurements on them

Defense Loans Top $500 Million

Defense production loans totaling $514,500,000 were authorized by guaranteeing agencies through Federal Reserve banks from September, 1950, through May, 1951. Program for guaranteeing defense production loans is authorized under Regulation Five of the board of governors of the FRB.

Financing institutions advanced $286 million on guaranteed loans in this period. Of this total, $102.4 million was repaid, leaving an unpaid balance of $183.6 million on May 31.

World Congress To Hear Wilson

Defense Mobilizer Charles E. Wilson will be the major speaker at the closing session of the World Metallurgical Congress in Detroit, Oct. 19. He'll speak on the strategic importance of world metal conservation and production to free world defense.

The Metallurgical Congress —first of its kind—is sponsored by the American Society for Metals and will be held concurrently with the society's National Metal Congress & Exposition. The Wilson meeting will be staged in the Statler Hotel.

Packard Claims It Must Double Number of Suppliers

SOME SMALL BUSINESSES still shut out of defense and defense-support activity may find jobs when automakers finally begin work on contracts awarded months ago. One example is cited in the case of Packard Motor Car Co.

More than twice its present number of suppliers will be needed by Packard when its combined civilian-military program gets under way. Presently buying from 1100 firms, R. R. Rees, director of purchases, states that about 2500 suppliers are going to be required for its performance on the Air Force J-47-GE-23 jet engine contract and the $20 million Navy contract for Packard-designed marine diesels.

A new order that adds $55 million to a previous commitment for howitzer motor carriages at Massey-Harris Co. should provide opportunity for additional subcontractors . . . York Corp., York, Pa., has a long-term Navy contract valued at $2.5 million to build large naval aviation rocket motors . . . Robertshaw-Fulton Controls Co. had $20 million in defense orders on hand on July 1.

More contracts, awarded by the government, follow:

PRODUCT	CONTRACTOR
Bomb and Torpedo Trucks	American Chain & Cable Co. Inc., York, Pa.
	Lewis-Shepard Products Inc., Watertown, Mass.
	Gray Iron Casting Co., Mt. Joy, Pa.
Locomotives, Diesel Electric	Davenport Locomotive Works, Davenport, Iowa
Railway Cranes	Industrial Brownhoist Corp., Bay City Mich.
Gasoline Engine Driven Blowers	American Air Filter Co. Inc., Moline, Ill.
Ground Portable Heaters	Airesearch Mfg. Co., Los Angeles
	Hepner Mfg. Co., Round Lake, Ill.
Compressors	Cornelius Co., Minneapolis
Air Compressor and Dryer Units	Poole & Kent Co., Baltimore
Motors	W. L. Maxon Corp., New York
Signal Generators	Starrett Television Corp., New York
	Lavoie Laboratories Inc., Morganville, N. J.
	Federal Mfg. & Engineering Corp., Brooklyn, N. Y.
Radar Training Sets	Transducer Corp., Boston
Instrument Flying Trainers	Curtiss-Wright Corp., Wood Ridge, N. J.
Power Plants	Fairchild Engine & Airplane Co., Farmingdale, L. I., N. Y.
Amplifiers	Rauland Borg Corp., Chicago
Transformers	Automatic Mfg. Corp., Newark, N. J.
	Triad Transformer Mfg. Co., Los Angeles
	Standard Coil Products Co. Inc., Los Angeles
Transformers and Coils	Westinghouse Electric Corp., Philadelphia
	Barker & Williamson Inc., Upper Darby, Pa.
	Capehart-Farnsworth Corp., Ft. Wayne, Ind.
Dynamotors	Eicor Inc., Chicago
Harbor Tugs	American Electric Welding Co., Baltimore
	Wiley Mfg. Co., Port Deposit, Md.
	Romer Boat Co., Holland, Mich.
	Avondale Marine Ways Inc., Westwego, La.
	Olson Corp., Beresford, Fla.
Hydraulic Jacks	Walker Mfg. Co., Racine, Wis.
Refrigerating Units	U. S. Thermo Control Co., Minneapolis
	Ed Friedrich Inc., San Antonio, Tex.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to U. S. Commerce Department, Division of Printing Services, attention E. E. Vivian, Room 6225, Commerce Bldg., Washington 25. For ESA orders, write J. L. Miller, Economic Stablization Agency, Room H367, Temporary E Bldg., Washington.

Controlled Materials Plan

CONSUMER DURABLES—Direction 1 to NPA Order M-47A states that in applying for allotments of steel, copper and aluminum for the fourth quarter of 1951, manufacturers of durable goods must not call for more materials than are needed to make and assemble products to fill rated orders during that quarter plus the quantity of materials permitted for consumption in the third quarter under terms of M-47A. While these manufacturers are not under CMP, information on their requirements is needed so that effective distribution of steel, copper and aluminum can be developed if it is decided to include consumer durables under CMP in the fourth quarter. Direction 1 was issued July 20, 1951.

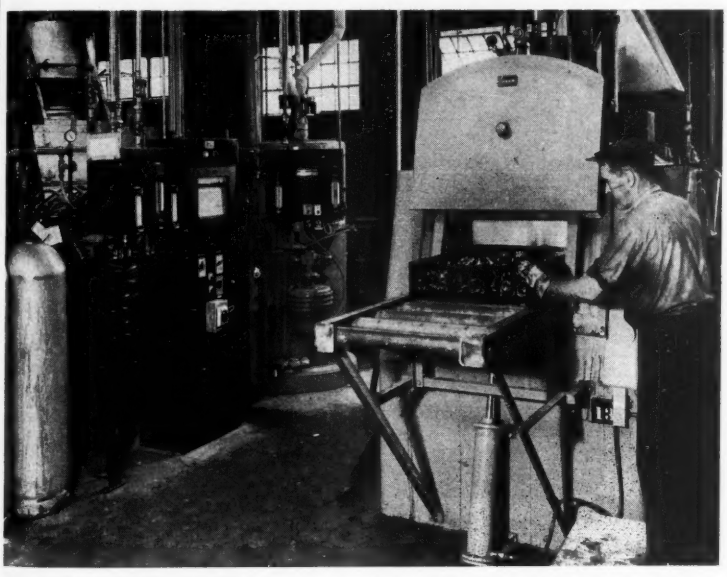
Price Regulations

LEAD—The Office of Price Stablization issued a correction July 18 to Ceiling Price Regulation 53 (Lead Scrap Materials, Secondary Lead, and Antimonial Lead). Corrected are inadvertent errors.

COKE, CHEMICALS, GAS—Amendment 3 to Supplementary Regulation 13 to the General Ceiling Price Regulation corrects an omission of dates in Amendment 2. Amendment 3 was issued July 18, 1951. Supplementary Regulation 13 deals with coke, coal chemicals and coke oven gas.

TOOL STEELS—Supplementary Regulation 42 to the General Ceiling Price Regulation establishes higher ceiling prices, with varying increases, for manufacturers of high speed tool steels and specialty steels containing tungsten, hard facing products containing tungsten, and pure tungsten and thoriated tungsten products. Adjustments in ceiling made by SR 42 will allow manufacturers to recover most of the increase in tungsten-bearing raw materials costs since the GCPR base period. SR 42 is an interim measure; OPS will shortly undertake a study of the operations of manufacturers to determine the need for changing the ceiling prices so established. SR 42 was effective July 19, 1951.

TOOL STEELS—Amendment 17 to Ceiling Price Regulation 22 excludes from CPR 22 the products covered (high speed tool steels and other metal products containing tungsten) in Supplementary Regulation 42 to the General Ceiling Price Regulation. Amendment 17 was effective July 19, 1951.



CYCLE FOR MOTORCYCLE: A tray load of motorcycle clutch gear nuts are prepared for carbon nitriding in this new gas-fired Ipsen heat treating unit at Harley-Davidson Motor Co., Milwaukee. Parts such as clutch plates, stand brackets and steering heads are automatically handled through the entire heating and cooling cycle. The atmosphere sealed furnace is capable of performing normalizing, stress relieving, carburizing, gas cyaniding, brazing, hardening, and straight heat treating

TOOL STEELS—Amendment 5 to Ceiling Price Regulation 30 excludes from CPR 30 the products covered (high speed tool steels and other metal products containing tungsten) in Supplementary Regulation 42 to the General Ceiling Price Regulation. Amendment 5 was effective July 19, 1951.

CEILING PRICES—Amendment 1 of Supplement 1 to Delegation of Authority 6 permits directors of the divisions of the Office of Price Operations, Office of Price Stabilization, to establish a ceiling price in accordance with any ceiling price regulation which provides for the establishment of a ceiling price by the director of price stabilization either where the ceiling price proposed by the seller under the regulation has been disapproved in whole or in part, or where more information is required. Amendment 1 was effective July 20, 1951.

CEILING PRICES—Amendment 1 of General Overriding Regulation 13 of the Office of Price Stablization says that manufacturers may start pricing under the general manufacturers' order (CPR 22) and related manufacturing regulations if they had complied with their terms and announced new prices before July 1, even though the price lists were not effective until after that date. If manufacturers complied with the various requirements of the regulations and could have sold at new ceilings on or before June 30, 1951, they may now use these ceiling prices if they made a public announcement of the price changes before July 1, 1951. Amendment 1 was issued July 23.

FTC Hits 17 Sewer Pipe Firms

Federal Trade Commission Trial Examiner Frank Hier holds that 17 manufacturers of vitrified clay sewer pipe have combined in unfair pricing practices for the last five years.

His decision ordering an end to the joint action becomes effective in 30 days unless the companies appeal to the FTC or the commission on its own motion takes up the case for review. The 17 firms operate about 25 of the 75 plants in the nation making the pipe.

Radioisotopes for Foreigners

The Atomic Energy Commission for the first time has made some U. S.-produced radioisotopes available to foreign users for industrial research and applications.

The action increases the number of U. S.-produced isotopes available to buyers in foreign countries from 26 to 99. Among the more useful of the newly available isotopes are cesium-137, yttrium-91, selenium-75 and tantalum-182, which all have applications in industrial research; and chromium-51, nickel-59 and 63 and tungsten-185 which are useful in metallurgical research.

The U. S. radioisotope export program has been in effect since Sept. 3, 1947.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

So much of the Commerce Department's time is being spent in getting information that it has little time to get out reports. That's why statistics on primary metals will be late

COMPLAINTS are mounting in the Commerce Department over delays in issuing monthly statistics on such primary products as ferrous and nonferrous castings, commercial forgings, steel drums and barrels, steel boilers, etc. The reason: Reports are being released several months late. Statistics on gray iron, malleable and steel castings for example have just come out now for January-April and no promises are made for May.

Threefold Wrinkle—Why the delay? First, the Census Bureau and Bureau of Mines (they gather the information) made some changes in their forms this year to improve their statistics — and it took some time for reporting manufacturers to get used to them.

Second, manufacturers nowadays must file many reports to a host of government agencies that they don't have to bother with normally—and those extra reporting burdens slowed them down. Third, statistical information because of the defense program must be obtained and collated in a great deal more detail than in ordinary times.

Cases in Point—It had been the custom for the Census Bureau to base its castings statistics on returns from 600 foundries. But early this year NPA said that wouldn't do; for the purpose of fairly distributing available materials supplies it needed reports on every individual foundry. So the Census Bureau sent out forms to approximately 3600 foundries in the United States. Naturally, there was delay. Again, where ferrous scrap previously had been reported in one total, it became necessary for NPA purposes to break the total down into 21 different grades of scrap.

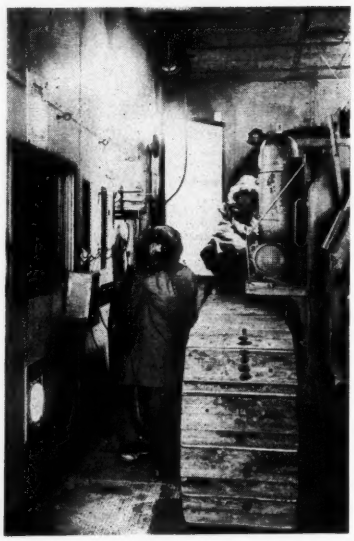
Well, the Commerce Department hopes to get back to a schedule of current reporting before the end of the year—but it's keeping its fingers crossed.

To Date on Titanium . . .

Copies of a "Symposium on Titanium" compiled by the Defense Department's Research & Development Board may be had free by writing to the Office of Technical Services, Commerce Department, Washington 25. Order number is PB 103 564. The book reviews the titanium research projects of the armed services.

The Search Is On . . .

Now that a new laboratory-size rolling mill is installed, the Bureau of Mines' Experiment Station at Redding, Calif., is ready to proceed with a research investigation of vital importance to the steel industry. The purpose is to determine the minimum amounts of manganese that must be used with different sulphur contents to get satisfactory rolling of steel. In particular, answers will be sought on how much manganese is needed to produce high sulphur, free machining screw stock that will not crumble in the rolling operation. The investigation will start with pure iron to which controlled amounts of sulphur and manganese will be added. The new mill, built by United Engineering & Foundry Co., is designed to roll 2-inch square billets into ¾-inch rounds.



BIG OPERATION: The Army's Engineer Research & Development laboratories at Ft. Belvoir, Va., occupy 24 buildings where 1800 engineers work on such things as field testing of bulldozers, new equipment to put out intense fires and testing equipment for arctic cold and desert heat. Here, a Caterpillar tractor goes through a low-temperature test in a cold room

Goings on Abroad . . .

Co-operative research work among Western European countries, under the stimulus of our Marshall Plan, includes a project of potential interest to the American iron and steel industry. It is a study to determine the cheapest methods for producing iron and steel from low-grade iron ore and coal, plentiful in Europe. To increase furnace efficiency so-called "enriched air" is to be used.

An experimental blast furnace for this purpose now is under construction near Liege in Belgium. Participating countries are the United Kingdom, Belgium, France, Netherlands, Italy and Western Germany. The project is under direction of the Organization for European Economic Co-operation, headquartering in Paris.

Penalty Provision Pigeonholed . . .

H. R. 2401, the Walter bill—passed by the House on Apr. 17—appears to be permanently pigeonholed in a subcommittee of the Senate Judiciary Committee. The measure stemmed from a belief that the existing maximum penalty of $5000 for criminal violations of the Sherman antitrust law was not effective in encouraging compliance. Under the Walter bill the maximum penalty is $50,000.

Shifts and Changes . . .

New changes in key personnel in NPA's Iron and Steel Division are: F. A. McClelland, Wheeling Steel Corp., replaces E. J. Sanne, Inland Steel Co., as chief, Tin Plate Section . . . James Hudson, Grammer, Dempsey & Hudson Co., Newark, N. J., replaces G. Russell Link, Central Steel & Wire Co., Detroit, as chief, Warehouse Section . . . C. T. Hapgood, Jones & Laughlin Steel Corp., replaces Jay W. Owings, Youngstown Sheet & Tube Co., as chief, Pipe & Tube Section. . . W. J. McCune, Sharon Steel Corp., replaces John S. Ewing, United States Steel Co., as chief, Stainless Steel Section.

William Webster resigned as chairman of the Defense Department's Research & Development Board to return to his post with a New England electric power company. Walter Gordon Whitman, Massachusetts Institute of Technology, was nominated to succeed him.

MORGOIL
ROLL NECK BEARINGS

Closer Tolerances?
Lighter Gauges?
Higher Speeds?

THE marked trend towards closer tolerances, lighter gauges and higher speeds in the rolling of metals is presenting many new problems to rolling mill operators.

MORGOIL Bearings are helping to solve these difficulties by the accuracy and precision of their manufacture, absence of wear between journal and bearing, and the maintenance of uniform roll neck temperatures.

Evidence of this fact is the ever increasing use of MORGOILS on 2-High and 4-High aluminum foil mills and 4-High reversing and tandem cold mills in the brass and steel industries.

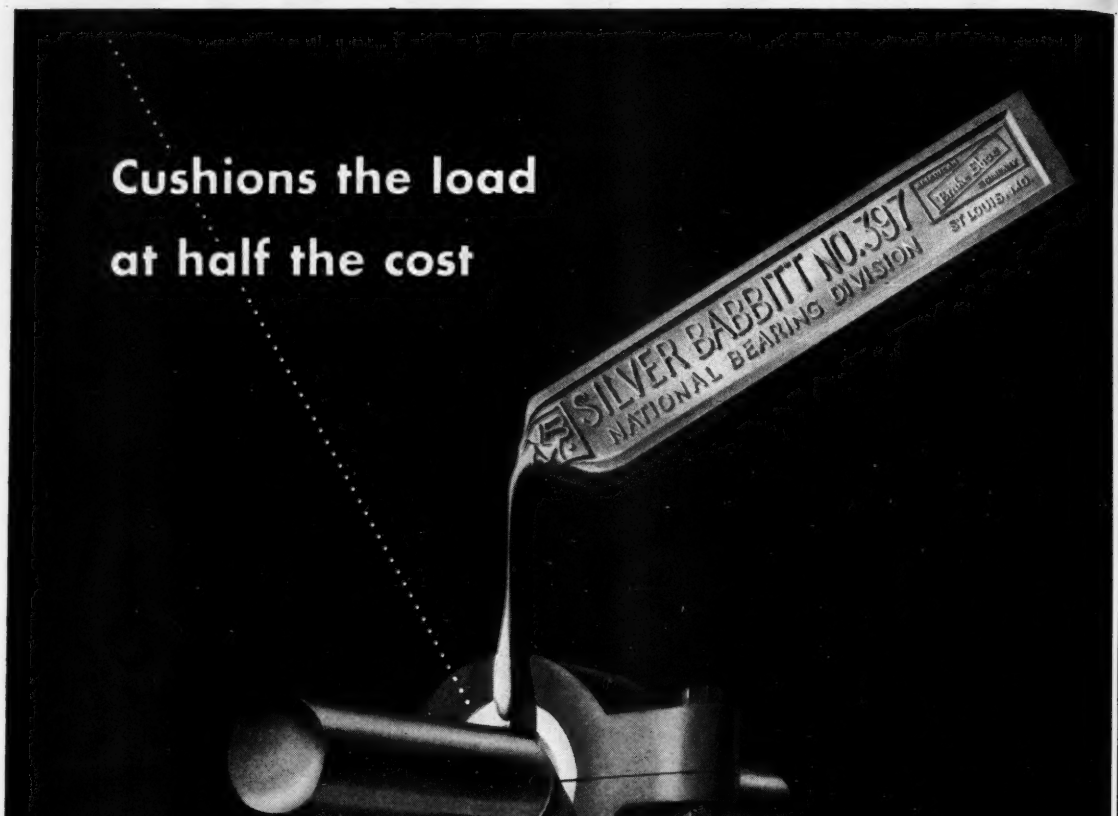
May we give you our latest information?

MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS

English Representative: International Construction Co.
MB-14 56 Kingsway, London W C. 2, England

MORGAN
WORCESTER

Rolling Mills - Wire Mills - Gas Producer Machines - Regenerative Furnace Control



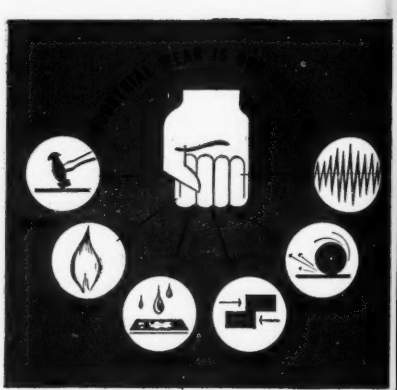
N-B-M SILVER BABBITT PERFORMANCE PROVES PROFITABLE TO INDUSTRY

The high speeds and huge loads of the spinning shafts of industry's giant machines create tremendous pressures and life-sapping heat which bearing materials must cushion and absorb. These forces of wear exact an enormous toll in bearing breakdown and replacement cost and possible shaft damage that is many times more costly.

N-B-M #397 Silver Babbitt is a low-cost bearing lining metal which will withstand this rigorous service. It retains hardness at high temperatures, yet it is soft enough to embed dirt and grit that might cause shaft damage. It has exceptional anti-frictional properties that help prevent shaft seizure if lubrication fails.

As a plant superintendent in one industrial plant wrote: "I was naturally skeptical of #397 Silver Babbitt compared to tin base babbitt because of the low cost, but it has given us 4 to 5 times the service."

Our National Bearing Division engineers are specialists in brass, bronze and babbitt metal alloys. Their experience goes back to 1874. Complete research and engineering facilities are available to help you with your bearing problems. Write Department G for descriptive folder.



AMERICAN Brake Shoe COMPANY

230 PARK AVE., NEW YORK 17, N. Y.

10 Divisions of American Brake Shoe Co. produce wear-resisting parts in 55 American and Canadian plants.

AMERICAN BRAKEBLOK DIVISION • AMERICAN FORGE DIVISION • AMERICAN MANGANESE STEEL DIVISION
BRAKE SHOE AND CASTINGS DIVISION • ELECTRO-ALLOYS DIVISION • ENGINEERED CASTINGS DIVISION
KELLOGG DIVISION • NATIONAL BEARING DIVISION • RAMAPO AJAX DIVISION • SOUTHERN WHEEL DIVISION

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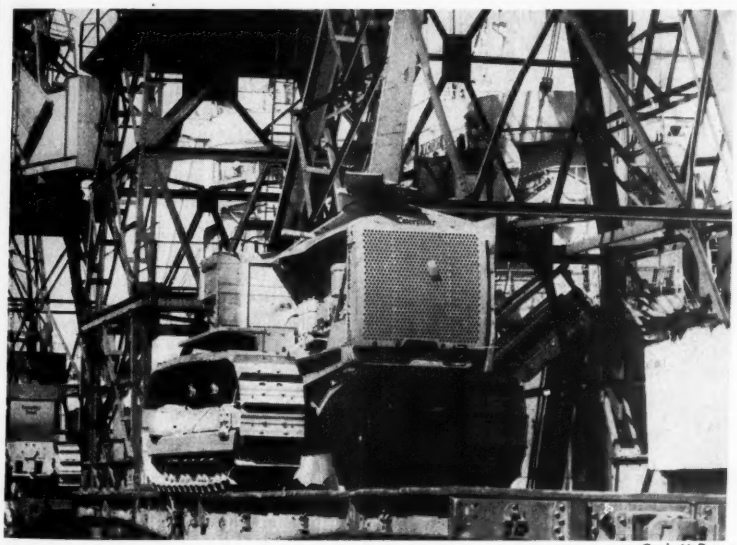
SERVICING CATERPILLAR DIESEL TRACTORS
. . . a nightly task on a six-day, 136-mile trip through the bush

Delivering Tractors — Through the African Bush

DELIVERING a dozen Caterpillar tractors and Davis heavy-duty plows through the African bush country is no snap—as United Africa Co. (Technical) Ltd. found out. The company had to deliver the machines to the Sokoto rice project in northern Nigeria before the plowing season began, and a big hitch was that the nearest rail terminal was 136 miles away. UAC got the job done, but it took six days.

The tractors were "walked" across the country and crossed the Sokoto river at a shallow point. They were driven by natives from the Sokoto rice project who had to be trained for two weeks before they started the journey. Floods, mud and curious natives didn't ease the strain on the drivers or the native guide. But the latter, a resourceful chap, told the villagers along the route that the tractors were for the Sultan of Sokoto himself. That helped.

And the Caterpillars wormed their way through the jungle in time for the plowing season.



Carl McDow

UNLOADING CATERPILLARS AT PORT ELIZABETH, SOUTH AFRICA
. . . a big market for road making machinery

Foreign Tool Exports Up

Thus far little of the increase has found its way into U. S. South America buys heavily

EUROPE's machine tool builders are expanding production.

Exports are increasing proportionately, but thus far little of that increase has found its way into the United States. South America is buying heavily, but the Europeans are not expected to crack the North American market unless deliveries offered by U. S. producers become drastically more extended than they now are. European prices are not enough lower than American to entice many U. S. buyers. Nor can the Europeans, except in isolated instances, surpass American quality.

Higher—The physical volume of Great Britain's machine tool output has increased 62 per cent since 1938, West Germany 16 per cent, Switzerland 68 per cent and Sweden 59 per cent. U. S. shipments were 75 per cent above the 1945-1947 average in May, 1951. They are more than 100 per cent above 1938 levels.

Major exporters of European machine tools are Britain, West Germany, France, Switzerland, Italy and Sweden. Most European builders deal abroad, including in the U. S., through agencies. Britain is the leading exporter, West Germany is second. The latter's machine tool deliveries abroad are about 66 per cent as much as the U. K. exports. West Germany's exports amount to about 26 per cent of its total machine tool production. Some 15.7 per cent of total German exports consist of machine tools.

Strong—Great Britain and Italy are strong in South American markets. Germany is, too, but her position is not what it was before World War II. Of all European tool exporters, Switzerland perhaps enjoys the best position in the U. S. That's because of the popularity of the Swiss jig borers.

One nation which has become an important machine tool exporter since the war is Sweden. Machine tool expansion during the past few decades has been more pronounced than that of any other industry in the country. "Its tools, on the whole," says National Machine Tool Builders' Association, Cleveland, "are comparable in type and performance to those made in the U.S." Quality is good, and the nation's producers make most of the ordinary types. Special models, which cannot be profitably made because of the limited domestic market, are imported.

Tool Builder Blasts GOR 15

Blackall says the regulation replacing CPR 30 is dangerous profit control

GOR 15 is based on a formula of inefficiency-plus.

That's how Frederick S. Blackall Jr., vice president of National Machine Tool Builders' Association and president and treasurer of Taft-Peirce Mfg. Co., Woonsocket, R. I., describes the general overriding regulation issued by Office of Price Stabilization, supposedly to permit machine tool makers to make liberal individual adjustments in ceiling prices. GOR 15 went into effect July 16 (STEEL, July 16, p. 45) and superseded CPR 30, to which tool builders had previously been subjected.

The Charge — Mr. Blackall says GOR 15 is a regulation of profit control, not price control. Under the regulation, a machine tool company computes its average rate of return on total assets from 1938 to 1948 inclusive and is then permitted to realize 80 per cent of that rate when applied to its total assets today. Working backward from the allowable percentage of profit, the manufacturer may fix his prices for 12 months ahead at levels which he estimates will yield the profit allowed. But if the profit turns out to more than 5 per cent in excess of the rate allowed, the excess must be refunded to customers.

In a letter to congressmen, Mr. Blackall makes these complaints: The refund provision is equivalent, in effect, to a 100 per cent excess profits tax administered by OPS; the regulation puts a floor under the earnings of the inefficient and high-cost manufacturer; the regulation does not carry out the directive of the Office of Defense Mobilization to stimulate production or provide incentive; the regulation has sinister implications for it could well serve as a profit-taking pattern to be applied to other industries.

What Is Wanted? — The machine tool builders seek controls based upon prices quoted during the freeze period, plus such allowances for increased costs as OPS considers proper.

Mr. Blackall also points out that those needs were clearly pointed out to OPS in months of discussion of the subject between the industry's advisory committee and government officials.

Mr. Blackall says the machine tool builders recognize the need for price controls, but do not see the necessity of profit curbs.

Inland To Build Houses

Inland Steel Co. will build 100 homes for Inland workers at East Chicago, Ind.

Preliminary plans call for erection of three-bedroom, two-story duplex houses similar in construction to the 100 buildings now operated by Inland in its Sunnyside development between 140th street and Industrial highway on the eastern limits of East Chicago.

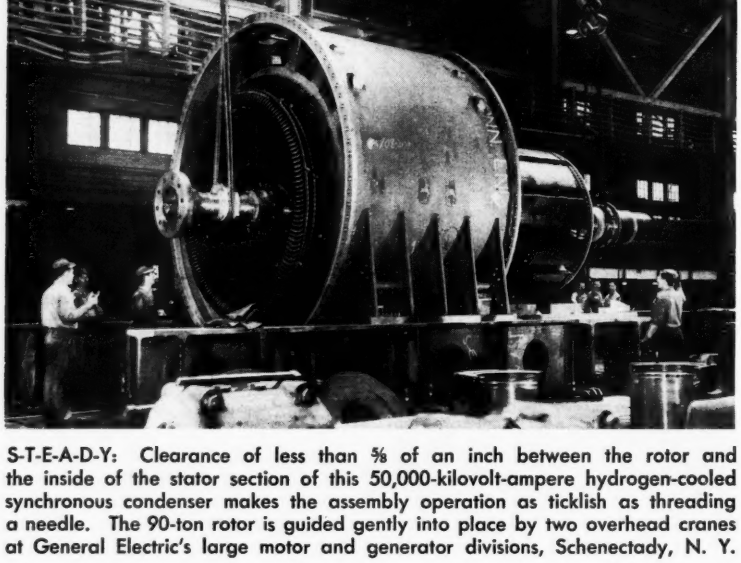
A Gunnison First: PHA Homes

Gunnison Homes Inc., U. S. Steel's prefabricated housing subsidiary, will be the first in the history of its industry to enter public housing when it starts making 91 prefabricated buildings for a project in New Albany, Ind. William E. Bergeron, director of the Chicago field office of the Public Housing Administration, made the announcement. He says the average room cost is $1654 for the New Albany project.

John J. O'Brien, president of Gunnison, says his company will compete for additional PHA projects throughout the nation.

Fathers of Invention Cash In on Ingenuity

NECESSITY may be the mother of invention, but ingenuity is probably the father. A few of the ingenious "fathers" who spend their time thinking up ways to save money, or make things easier for everyone or just make a better product more efficiently and quickly were rewarded by their organizations in the past few weeks:



S-T-E-A-D-Y: Clearance of less than ⅝ of an inch between the rotor and the inside of the stator section of this 50,000-kilovolt-ampere hydrogen-cooled synchronous condenser makes the assembly operation as ticklish as threading a needle. The 90-ton rotor is guided gently into place by two overhead cranes at General Electric's large motor and generator divisions, Schenectady, N. Y.

Feather in Cap, $5000 in Hand

A man with a feather in his cap and $5000 in his hand is Graham S. McCloy, 44-year-old engineer in Westinghouse Electric Corp.'s Appliance Division, Springfield, Mass. For Mr. McCloy is the inventor of a fully automatic defrosting refrigerator. He was handed a $5000 check by Gwilym A. Price, Westinghouse president; the award is part of a Westinghouse program to reward outstanding employee inventors.

Previously, three East Pittsburgh, Pa., engineers were honored for an enameled wire development and one Sharon, Pa., engineer for a distribution transformer improvement.

Mechanized Stevedore Adopted

Never seen by its inventor—he is blind—an endless-chain conveyor for moving heavy freight in cargo airplanes was ordered for installation in a new Lockheed Aircraft Corp. Constellation-type military transport. The mechanized stevedore is the latest device invented by Henry P. Trusty since he was blinded by a head injury in World War I. Trusty is also the inventor of a corrugated box machine, the static chord used by paratroops for automatic chute opening,

the rumble seat, and a doughnut-making machine.

The conveyor is an outgrowth of Trusty's parachute-opening static chord.

Idea for Armco Pays $2000

Armco Steel Corp.'s three-year old suggestion system at Middletown, O., is paying off—to the company and its employees. A check for $2000 was recently paid out to an employee for a material-saving suggestion. The idea was to use a waste product to replace a more costly material that Armco had been buying for years. The plan's setup allows the person submitting an idea 10 per cent of the savings effected during the first year after adoption.

Westinghouse to the Rescue

Emergency repair facilities were set up in a 30,000-square-foot area of the Westinghouse jet engine plant in Kansas City, Mo., to speed up industrial rehabilitation of the flood stricken area.

Westinghouse workmen, engineers and equipment were made available on a 'round-the-clock basis for cleaning, drying and rebuilding electrical equipment damaged in the area's worst flood of the century. Aiding in the program are personnel of the Navy for whom Westinghouse operates the jet engine plant.

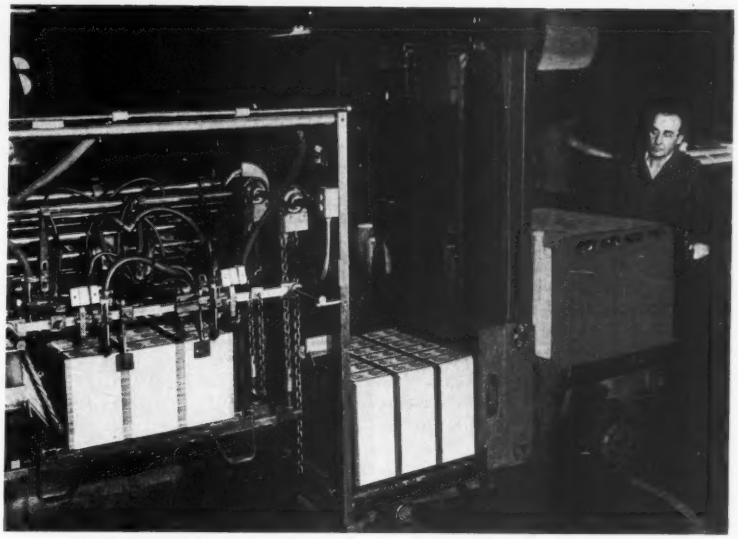
Besides providing on-the-spot emergency facilities, Westinghouse: Made arrangements to make available any piece of electrical equipment needed (they'll come from warehouse stocks); made plans at each of its manufacturing plants to take care of repairs that cannot be handled at Kansas City (personnel from St. Louis, Houston and Chicago will lend a hand); is working with local electric utilities to locate power apparatus that can be pressed into service.

Students Have Cake, Eat It Too

College students, picking up extra money during summer recess by working in steel mills, are "retiring" well before the opening of the fall term—and that income tax man is to blame.

If they earn over $500 in the year, their fathers can not claim them as dependents. So, counting their earnings carefully, they find they can work up to the assessment limit and travel or loaf till the new term begins.

Weirton Steel Co. reports several hundred students hired as temporary summer workers have asked for work releases already.



"CURB" SERVICE: In Crown Can Co.'s Philadelphia plant a "table"-type lift truck places a skid load of tin plate sheets into proper position for feeding through a lithographing press. The load of 3500 pounds of partially processed tin plate will later be formed into tin cans. Handling of material by any means but mechanical has been practically done away with at the Crown plant

Fan Sales: Not So Hot

Those cool nights in June and early July mean listless activity

THOSE cool nights in June and early July were welcomed by all but the fan distributors. This seasonal industry, which must capitalize on the discomfort of the public, is sweating for the second straight year to spur listless sales.

Retailers of home and office ventilating fans are moving their product at only about a 10 per cent advance over 1950's exceptionally slow pace —but even this record is not reflected at the distributors' level. The latter mention drops ranging from 10 to 35 per cent from last year and cite "miserable fan weather" in 1950 to explain a big carry-over by retailers.

Scorcher—A scorching spring and summer in 1949 cleaned out retailers' salesrooms and caused them to buy last year for at least a comparable demand. When that failed to materialize, they stored the leftovers for another summer—thus shutting distributors out of their normal preseason sales.

One Cleveland distributor reported no preseason sales whatever to two of its largest outlets. The reason: Both were sitting on late summer stock from 1950 and were reluctant to supplement an inventory already considered adequate. The warmish late July has finally caused buyers to fill in with new orders to help bring the distributor's sales up to a more respectable level.

A retailer termed sales "pokey" compared with the scorching 1949 record. He believes it will take two or three hot, humid nights when father is at home suffering to get sales rolling this summer.

Alcoa Stints Aluminum Facade

At the request of Defense Production Administrator Manly Fleischmann, Aluminum Co. of America will leave the lower six floors of its new 30-story home office building unfinished. Instead of aluminum panels the floors will be faced with temporary materials and be finished at a later date.

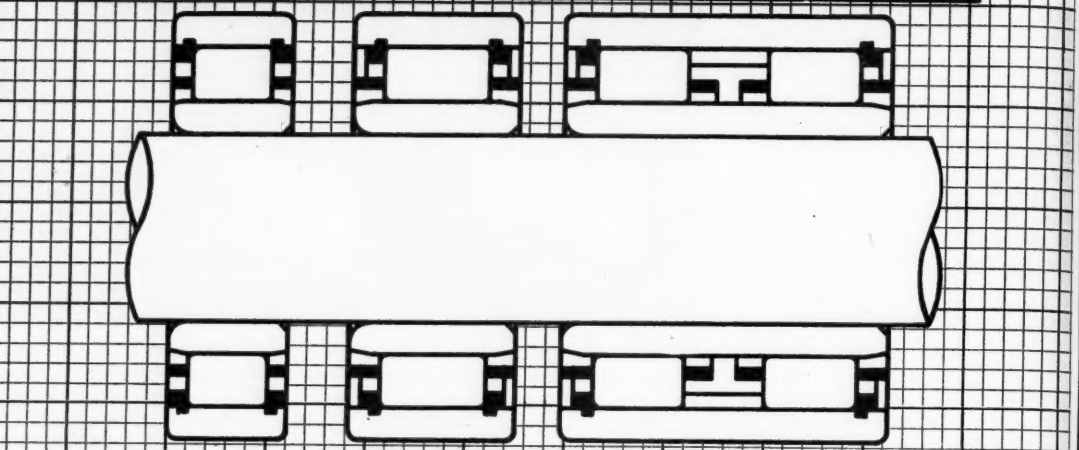
All aluminum for the project was set aside months ago; no aluminum is being taken from current production for the Alcoa building.

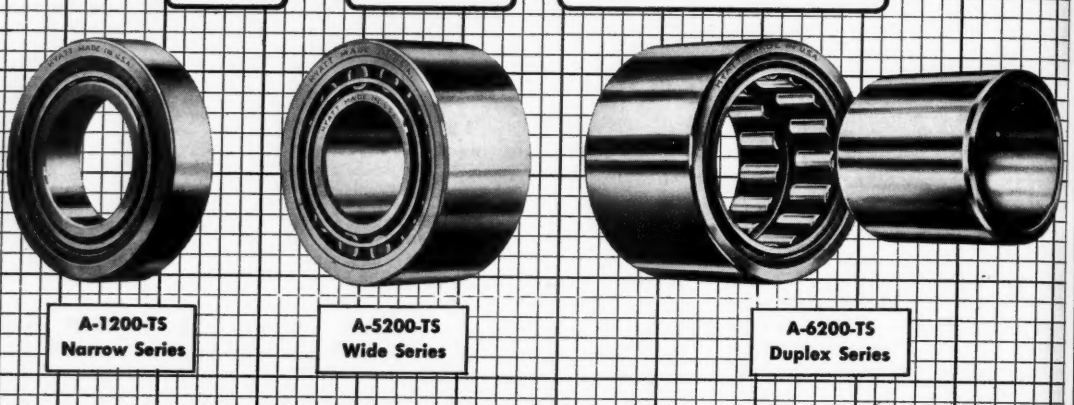
Completion of the building next year will permit Alcoa to concentrate all of its general offices in one structure.

Mellon Plans Open House

Mellon Institute of Industrial Research, Pittsburgh, will hold open house Sept. 15-16 for the first time since 1937 when it was dedicated. Visitors will see results of the institute's research and observe its scientific facilities through demonstrations and exhibits in two-hour conducted tours of the building.

For Greater Bearing Capacity—
HYATT HY-LOADS





A-1200-TS
Narrow Series

A-5200-TS
Wide Series

A-6200-TS
Duplex Series

Where bearing overall dimensions must be kept to a minimum, Hyatt Hy-Load Light Series Roller Bearings are available in three widths to satisfy load requirements and permit wide design range.

As greater load-carrying capacity or longer bearing life is required for a given shaft size and bore diameter, you can go progressively from the narrow, to the wide, or to the duplex series of Hyatt Hy-Load Bearings as illustrated.

When operating speeds are relatively low, greater radial capacity can be obtained in limited space with Hyatt Hy-Loads of the full complement type. In this type of bearing, available in both wide and narrow widths, the roller separators are eliminated, and the maximum number of rollers are employed to provide increased capacity within the same boundary dimensions.

Write for a copy of catalog 547 . . . a complete guide to the selection and use of radial roller bearings. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

The UAW is having trouble with discipline and has transferred control of DeSoto Local 227 from its officers to a board member to stop walkouts

DETROIT

AN OLD hand in labor relations work in Detroit, last week said: "The UAW has lost its sense of timing. Now is the worst possible time, from their standpoint, for walkouts."

He was assuming that many of the interruptions at automotive plants are being union-inspired and have the sanction of UAW leaders. But a close look at two recent top-level union actions, shows the UAW official attitude strongly opposed to the rash of disturbances.

Drastic Action — The executive board of the international union on Monday took an unusual step by transferring control of DeSoto Local 227 from its officers to a board member whom it named as administrator of the Local's affairs. As explained by Norman Matthews, Director of UAW's Chrysler Department, "The international union was compelled to act to safeguard the interest of a vast majority of the DeSoto workers whose jobs were constantly threatened by irresponsible action of a small minority."

Since January, the DeSoto Warren Road Plant in Detroit has had about 70 shut-downs. The Wyoming Avenue Plant has had an additional ten. The work stoppages, Mr. Matthews said, have been caused by a "handful of people in key departments." Some shop stewards are in the group. The Local's officers are not held to blame for the walkouts and the new administrator is not planning to depose any of them. But his appointment gives him power to fire stewards and suspend union members without the customary hearing in the next 60 days.

Illegal—Most of the disturbances have been caused by alleged "speed-ups," and Mr. Matthews advised that union policy "is to authorize strike action against unwarranted increases in production standards wherever such action is shown to be justified and the membership votes approval . . . But the work stoppages at DeSoto have not been taken in compliance with the union constitution."

Hassle at Hudson

The Hudson ruckus is a somewhat less obvious example of the union's desire to avoid its customary method of forcing an issue. A vote was taken on June 25, with 4111 members of Local 154 favoring strike action and 1256 against it. UAW brass felt that then was no time to "hit the bricks" and are soft-pedaling any mention of a possible strike. Hudson, they figure, is immune to that kind of a club and would come out of a strike a lot better off than the strikers.

Different Tack at Hudson — It is using, instead, a public opinion approach to force settlement of the dispute. Full-page ads in local newspapers contained a letter to Senator Blair Moody under the heading, "The Truth About Layoffs at Hudson Motor Car Co." In that letter the union charged the company "with wilfully and deliberately violating the contract between the union and the company and violating agreements reached on production standards in order to tie up their production and thus have a convenient excuse not to operate their plants because they are unable to sell their products." Hudson is also accused of provoking production bottlenecks which they use as an excuse to send workers home in order to avoid payment of unemployment compensation to their employees."

The letter cites periodic reductions in production schedules since March, pointing out that prior to the May 22-June 11 shutdown output was brought down to 40 assemblies an hour. When the workers returned, the letter states, "they found that the company had arbitrarily reduced the negotiated manpower on over 40 jobs by some 111 men." This reduction in manpower was made without consultation with the union and in direct violation of agreements with the union, it charges. The smaller workforce has been unable to meet production schedules, it says. The result is that the company closes its plants every day as soon as uncompleted assemblies start coming off the line. Last Monday marked the 30th working day in which the pattern repeated.

The company as yet has had no official answer to the union's charges, and both sides of the dispute seem determined to bull it through until one yells "uncle." The union suggests that the company close its plants and allow present employees to get jobs elsewhere or draw unemployment compensation.

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,878
February	658,918	505,593
March	802,737	610,680
April	680,216	585,705
May	696,039	732,161
June	652,788*	897,853
July		746,801
August		842,335
September		760,847
October		796,010
November		833,874
December		671,622

Week Ended	1951	1950
June 30	156,105	197,767
July 7	98,087	137,731
July 14	117,747	194,073
July 21	128,017	187,339
July 28	132,000*	191,978

Sources: Automobile Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Troubles at Canton

The UAW is in an uncomfortable spot with respect to union-shop contracts. Center of the dispute, this time between the union and the National Labor Relations Board, is the Canton, O., Forge Division of Ford Motor Co., where the International Brotherhood of Blacksmiths, Drop Forgers and Helpers, AFL, is seeking an election to establish their right to represent the 1418 hourly-rated workers.

NLRB decided on July 11 that the blacksmiths could petition for an election since national CIO officers were not in compliance with the requirements for filing anti-communist affidavits under Taft-Hartley Law provisions when union security elections by affiliated unions were conducted. The fact that individual CIO union officials including UAW leaders had complied was beside the point.

"This decision," said Walter Reuther, president of the autoworkers, "is a threat to stable labor relations throughout American industry . . ." and "if allowed to stand would disrupt thousands of established bar-

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gaining relationships and encourage industrial unrest." CIO and Ford attorneys last week sought to win a reversal from NLRB, arguing that the contract had been made in good faith and should be allowed to stand for the four years it has to run.

Le Sabre Takes to the Road

The experimental General Motors car "Le Sabre," described in STEEL, Jan. 8, p. 39, when it was still being engineered, has now taken the road and will go on public display for the first time at the Michigan State Fair Aug. 31-Sept. 9. The product of almost five years' work by the styling section and by the Buick Division, this car undoubtedly sets a new record for custom-car cost and innovations.

Though appropriately designed as "a laboratory on wheels," it even more is a rolling testimonial to the increased stature of stylists in the automobile industry. It is the brainchild of one of the first and foremost of these—Harley J. Earl, GM vice president in charge of styling.

Small Beginnings—Back in 1927, after having designed the original LaSalle and redesigned Cadillacs, Mr. Earl was put in charge of the newly formed General Motors Art & Color Section.

Given little more than office and a drawing board and a plethora of uncomplimentary remarks by the engineers who thought that black was a good enough color for cars and that stylists belonged in the women's fashion industry, Mr. Earl went to work to change all this. Ten years later the styling section replaced Art & Color.

In GM now, styling plays as integral a role in motorcar building as engineering and research. The section employs 450 people whose talents include sculpturing in wood, plaster and metal, paint and trim selection and design. The section contains individual studios for each GM car division, and the truck and coach division. Also handled are other GM products, including diesel locomotives and household appliances. From it also come elaborate exhibits for special purposes.

New Departure—There are in the body construction of "Le Sabre" some significant departures from conventional procedure and material. All important members, for example, are cast magnesium and sheet aluminum. Magnesium castings are used for the deck lid, cowl, front fender valance, lock pillars and door inner panels. Aluminum sheeting is used for the hood, fenders, and door outer panels. The engine, likewise, makes extensive use of light metals, with the head and cylinder block being of cast aluminum alloy. The cylinder walls are lined with heat resistant iron castings and the valve seats are stainless steel inserts.

Obviously, General Motors has no immediate intention of transplanting these costly materials to production-run cars. Its faith in the long-term future of steel for automobile construction has been visibly displayed in the loans it has made to steelmakers to help finance their expansions. Nevertheless, there is the opinion among some Detroit automen that, when the defense requirements which are bringing about increases in aluminum and magnesium facilities subside, those metals will gain wider use in automotive applications. General Motors, they reason, will have an opportunity to explore some of those with "Le Sabre."

Chevrolet Expands in Buffalo

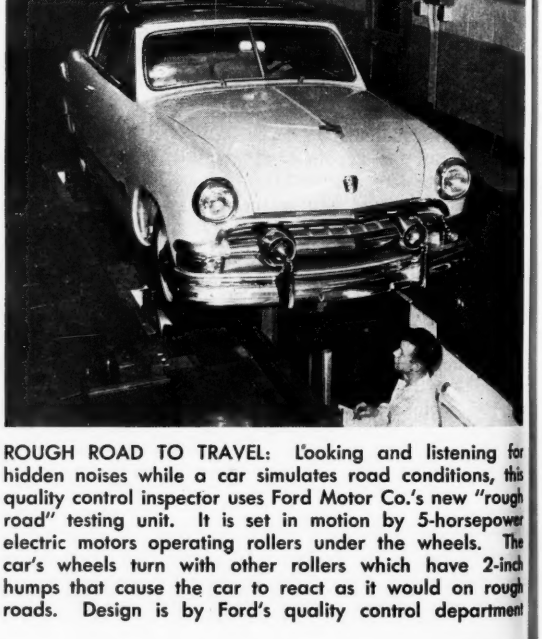
Chevrolet will erect three buildings at Tonawanda, N. Y., between its Tonawanda Manufacturing Division plant on River road and the government-owned Chevrolet Aviation Engine Division (nee Aviation Plant No. 1) on Kenmore avenue.

Adding almost one million sq ft of floor space to its operations, the company will use the new facilities in production of Wright R-3350 power plants for the Air Force and Navy.

Torture Chamber for Fords

Figuring out new ways to torture their vehicles in the laboratories is an ever-present job of automotive engineers. One of the fanciest devices for this purpose has been developed by Ford's quality control gage and test section. This "rough road" tester, measuring 30 feet in length, produces bumps and twists of greater magnitude than probably would be encountered on many roads.

GOOD OLD SUMMER TIME: Although the weather's hot outside, Nash Motor's cold room at Kenosha, Wis., is 20 degrees below zero. Summer's the time for the auto plant to test for the coming winter's freeze. Engineers, who must wear arctic garb, test oil reaction, starting and overall engine operation under the freezing conditions to improve winter performance. Temperatures of 40 degrees below zero can be registered in the "cold room"



ROUGH ROAD TO TRAVEL: Looking and listening for hidden noises while a car simulates road conditions, this quality control inspector uses Ford Motor Co.'s new "rough road" testing unit. It is set in motion by 5-horsepower electric motors operating rollers under the wheels. The car's wheels turn with other rollers which have 2-inch humps that cause the car to react as it would on rough roads. Design is by Ford's quality control department

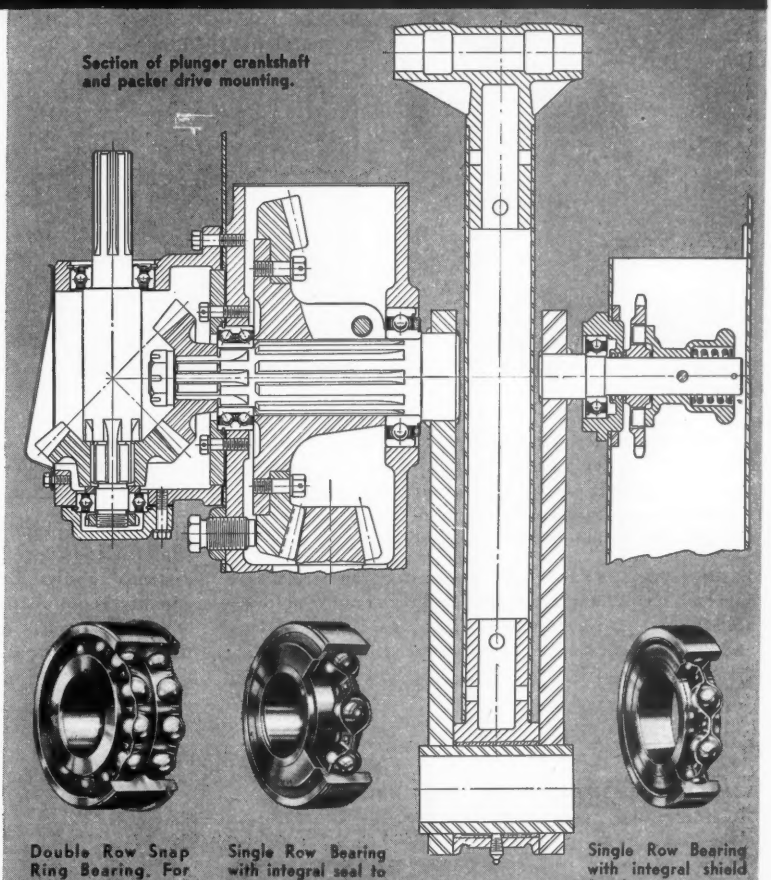
The Right Bearings for Better Baling

• In the McCormick No. 45 Automatic Pickup Baler, producing up to 5 tons of perfectly baled hay per hour, New Departure ball bearings in the main drive hold shafts and gears always in accurate relationship under rapidly fluctuating loads of crankshaft and plunger operating at 65 strokes per minute.

Ball bearings help to streamline and greatly simplify details of design. No provisions are needed for bearing adjustments and, by the use of bearings with integral seals or shields and snap rings for axial location, parts are kept plain and strong — fewer members are required.

Because of their ability to take thrust loads from either direction in a single, unit bearing in addition to radial loads, endwise location of each shaft is by one bearing only. Remaining bearings are free of any possible cramping action due to expansion changes under load.

The No. 45 Baler employs eleven New Departure ball bearings in various positions for smooth operation and long machine life.



Section of plunger crankshaft and packer drive mounting.

Double Row Snap Ring Bearing. For heavy combined loads in either direction.

Single Row Bearing with integral seal to retain lubricant and keep dirt out.

Single Row Bearing with integral shield for bearing protection and grease retention.

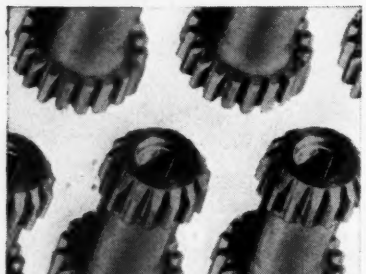
Nothing Rolls Like a Ball

NEW DEPARTURE BALL BEARINGS

NEW DEPARTURE · DIVISION OF GENERAL MOTORS · BRISTOL, CONNECTICUT

3 reasons why TIMKEN® steels give you better forgings at lower cost

1. UNIFORMITY!



2. HIGH QUALITY!

3. TAILOR-MADE!

1. UNIFORMITY! You get uniform composition, uniform forgeability and uniform response to heat treatment with Timken® forging steels. Rigid control and inspection methods insure this uniformity from bar to bar and heat to heat. Result: better finished forgings.

2. HIGH QUALITY! Because Timken forging steels have superior surface and internal qualities and uniform forgeability, you get better finished forgings. Rejects, delays, and shop practice changes are reduced.

3. TAILOR-MADE! Constant testing, plus advanced melting and finishing techniques keep the chemical and physical properties of Timken forging steels to your exact specifications.

If you have any kind of forging problem, call on our Technical Staff for assistance. And write on your company letterhead for our Technical Bulletin No. 31—a compact list showing chemical composition of Timken alloy and stainless steels. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

The Business Trend

Industrial production index slips below year-ago levels for the first time since March, 1950, but it's not alarming, as the last half of last year was a record-breaker

THIS MONTH marks the first time since March, 1950, that STEEL's industrial production index has not exceeded the level of the corresponding period of a year ago.

The week ended July 21 was the second consecutive one in which the index remained beneath the shadow of last year's performance. Preliminary index for the week ended July 21 was 211 per cent of the 1936-1939 average. In the corresponding week of last year the index was 214.

The first week of failure in this July to measure up to last year's level was that which ended July 14. For that week STEEL's index was 206 per cent, compared with 209 in the like week of 1950.

Why the drop? It's largely the result of government restrictions on automobile production, but to some degree of lower number of loadings of railroad freight cars. The other two factors in STEEL's index—steel production and electricity output—are running ahead of the level for this time last year.

Another reason for the narrowing of the gap between industrial production now and for the corresponding period of a year ago is that industrial activity began climbing in June, 1950, with the outbreak of the Korean war and continued at phenomenal levels during the last half of the year. Considering government restrictions on civilian production and the bite that taxes and inflation are taking out of the civilian consumers' dollars, it is not likely that industrial production from here on will exceed its year-ago counterparts with the margin that has been characteristic of the last 15 months.

The Guns Are Coming . . .

Much of the decline in production of automobiles and civilian goods will be offset by increased outturn of armament. Not only is the tempo of armament production rising in plants converting to defense equipment but many new plants are being built to produce defense materiel, and additional expansion goals for specific industries are being set.

More Billions for Defense . . .

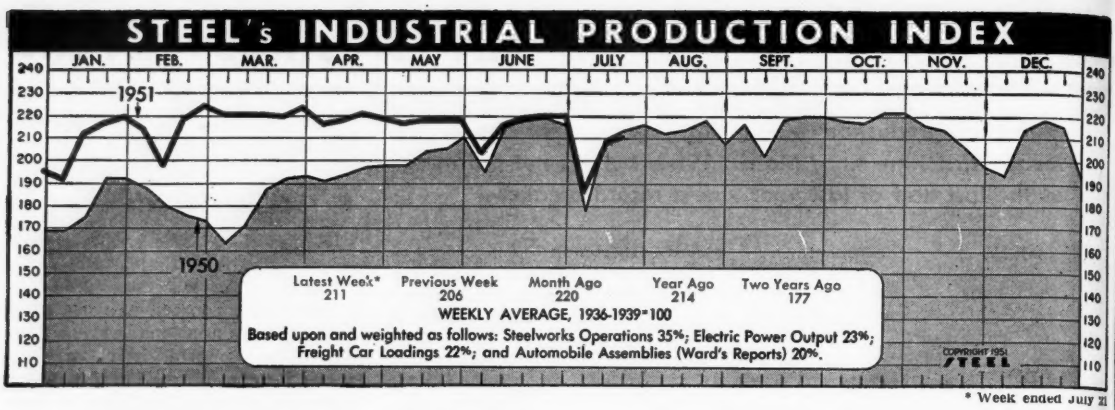
Korean peace talks or no Korean peace talks, the United States defense program will continue to be a potent factor in our economy. President Truman in his midyear economic report to Congress said our total security program expenditures, which now are at an annual rate of more than $35 billion, are scheduled to increase to an annual rate of more than $50 billion by the end of this year and to nearly $65 billion by the middle of 1952. This, he said, means that the proportion of the nation's total output devoted to security purposes will rise from the present 11 per cent to approximately 15 per cent by the end of 1951 and will approach 20 per cent by a year from now. Before Korea, it was 6 per cent.

Second Gear for Autos . . .

To share its metal supplies with the growing defense program, the automobile industry has had to shift down into second gear. Instead of turning out 180,000 to 190,000 pas-

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	102.0	101.5	103.0	98.0
	Electric Power Distributed (million kilowatt hours)	6,975	6,739	6,835	6,186
	Bituminous Coal Production (daily av.—1000 tons)	1,408	235	1,717	1,512
	Petroleum Production (daily av.—1000 bbl)	6,180	6,171	6,192	5,538
	Construction Volume (ENR—Unit $1,000,000)	$361.1	$361.0	$207.4	$343.3
	Automobile and Truck Output (Ward's—number units)	128,017	117,747	158,909	187,339
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	800†	779	833	830
	Business Failures (Dun & Bradstreet, number)	133	173	180	170
	Currency in Circulation (in millions of dollars)‡	$27,781	$27,893	$27,479	$27,029
	Department Store Sales (changes from like wk. a yr. ago)‡	−10%	0%	+1%	+25%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$15,525	$16,065	$17,830	$15,096
	Federal Gross Debt (billions)	$255.0	$254.7	$254.4	$257.2
	Bond Volume, NYSE (millions)	$13.7	$12.3	$11.8	$28.9
	Stocks Sales, NYSE (thousands of shares)	6,349	5,441	5,711	11,744
	Loans and Investments (billions)†	$70.1	$70.3	$69.5	$67.6
	United States Gov't. Obligations Held (millions)†	$30,697	$30,886	$30,555	$36,248
	†Member banks, Federal Reserve System.				
PRICES	STEEL'S Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.69
	STEEL'S Nonferrous Metal Price Index‡	226.0	226.0	226.0	192.1
	All Commodities†	178.8	179.7	181.6	164.3
	Metals and Metal Products†	188.2	188.2	188.2	172.6
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1951
1950
Latest Week* 211
Previous Week 206
Month Ago 220
Year Ago 214
Two Years Ago 177
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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* Week ended July 21

senger cars and trucks a week as it did this time last year, the auto industry in the United States and Canada produced 128,017 units in the week ended July 21, says *Ward's Automotive Reports*. Nevertheless, this was an upturn over the preceding week's 117,747. Materials availability continues to be the principal governor over production, although other depressants are labor troubles, summer vacations and the flood in the Midwest.

Steel Pours On . . .

Spurred by heavy needs of both civilian and defense production, the steel industry continues to operate at above rated capacity. It has been doing this since last March.

Output of steel for ingots and castings in the week ended July 28 was scheduled to be 2,027,000 net tons, a decline of 10,000 tons from the preceding week's outturn. A year ago, production was 1,892,000 tons.

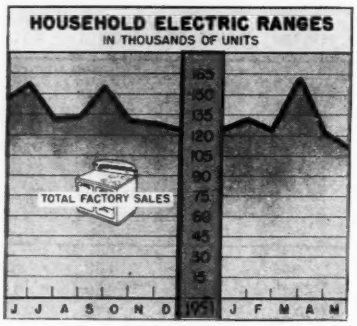
Even though the steel industry in operating above its rated capacity, the metalworking industry is not getting all the steel it could use.

Squeeze-Play on Sweepers . . .

The squeeze being inflicted on civilian production by the defense program is clearly demonstrated in the industry producing household vacuum cleaners.

With one exception, June was the first month in five years to see an output of less than 200,000 units. Factory sales in June totaled 194,548 units, reports the Vacuum Cleaner Manufacturers' Association. The other month in which sales fell below the 200,000-mark was July, 1949, when they dipped to 161,920 units.

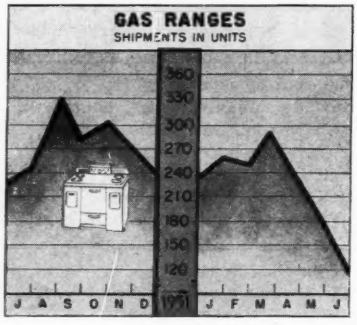
The June factory sales figure of 194,548 was a decrease from the preceding month for the third consecutive time and represented a 3.7 per cent decline from 201,983 units in May. June also was the fifth con-



Household Electric Ranges
Total Factory Sales—Units

	1951	1950	1949
Jan.	132,437	97,925	109,919
Feb.	123,953	118,989	88,333
Mar.	162,267	145,417	88,934
Apr.	122,803	132,859	60,739
May	109,572	145,498	52,881
June	.....	158,534	69,107
July	.....	130,505	63,249
Aug.	.....	132,243	66,753
Sept.	.....	156,216	93,045
Oct.	.....	130,452	73,312
Nov.	.....	129,384	60,523
Dec.	.....	124,360	77,011
Total	.....	1,602,382	903,806

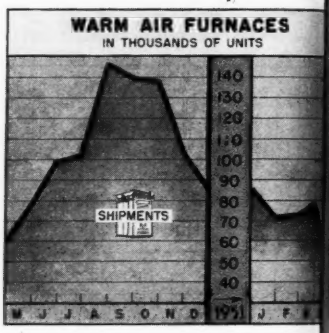
National Electrical Mfrs. Assoc.



Gas Ranges
Shipments in Units

	1951	1950	1949
Jan.	260,600	165,000	106,700
Feb.	254,000	209,000	117,700
Mar.	239,800	264,000	151,500
Apr.	225,000	239,100	150,100
May	172,700	242,800	151,600
June	113,300	217,000	162,200
July	.....	254,800	125,800
Aug.	.....	331,500	206,100
Sept.	.....	287,000	227,300
Oct.	.....	308,000	257,500
Nov.	.....	269,100	237,400
Dec.	.....	235,900	175,700
Total	.....	3,023,200	2,069,600

Gas Appliance Mfrs. Assoc.



Warm Air Furnaces
Shipments in Units

	1951	1950	1949
Jan.	71,143	39,887	31,734
Feb.	71,966	45,618	33,011
Mar.	79,239	59,952	41,271
Apr.	60,337	58,798	34,471
May	.....	78,349	42,406
June	.....	98,517	55,918
July	.....	102,189	48,575
Aug.	.....	145,512	85,320
Sept.	.....	139,014	112,264
Oct.	.....	137,915	103,401
Nov.	.....	102,001	79,280
Dec.	.....	85,407	52,323
Total	.....	1,093,189	719,972

U. S. Bureau of the Census

Charts—Copyright 1951, Ste

secutive month to show a decrease from the comparison period of 1950.

Furnace Business Cools Down . . .

Another industry reflecting the pinch from the defense program is that which produces gas-fired furnaces. Not all of the decline in furnace production can be attributed to the difficulty of procuring metals; part of it undoubtedly stems from restrictions on use of gas for heating.

In each of the months of the second quarter of this year, production of gas furnaces fell substantially below the corresponding months of last year, thus making the total output for the first half of this year 192,800 units, compared with 228,600 in the first half of 1950, reports the Gas Appliance Manufacturers Association.

Changing Jobs . . .

As the consumer goods industries continued to be pinched down, employment in them dropped off. But losses in them were offset by gains in defense-related industries, construction and food processing.

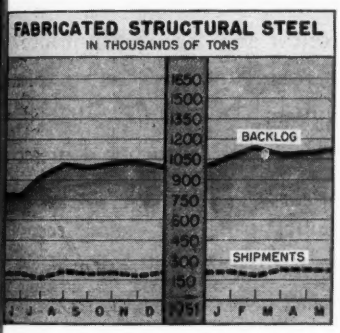
Overall, employment in nonfarm establishments rose between mid-May and mid-June to 46.4 million, compared with 46.2 million a month earlier.

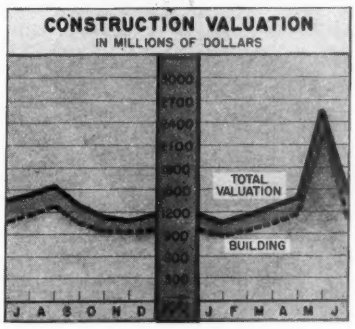
Trends Fore and Aft . . .

Heavy industrial building contract awards resumed their rapid pace and topped other classes of construction in the week ended July 19 . . . Class 1 railroads put 1309 new locomotives into service in the first half of 1951, compared with 1127 in the like period of 1950 . . . Cash dividend payments of United States corporations issuing public reports totaled $2500 million in the first five months of 1951, about 11 per cent higher than the $2264 million paid out in the corresponding period of last year . . . The week ended July 17 was the seventh consecutive one in which there was a decline in the wholesale price index of the U. S. Bureau of Labor Statistics. Latest index was 178.8 per cent of the 1926 average.

Issue Dates of other FACTS and FIGURES Published by STEEL:

Durable Goods July2	Indus. Production ..July23	Refrigerators June18
Employ., Metalwkg..July16	Ironers July16	Steel Castings July9
Employ., Steel July23	Machine Tools July2	Steel Forgings July2
Foundry Equip. July16	Malleable Castings ..July9	Steel Shipments July2
Freight Cars July23	Prices July23	Vacuum Cleaners ...June4
Furnaces, Indus. July2	Pumps, New Orders..July9	Wages, Metalwkg...June18
Gear Sales July9	Purchasing Power ..July23	Washers July16
Gray Iron Castings..July9	Radio, TV July16	Water Heaters June25





Fabricated Structural Steel

Thousands of Net Tons

	Shipments		Backlog	
	1951	1950	1951	1950
Jan.	214.0	154.7	1,067	756
Feb.	193.6	149.8	1,143	780
Mar.	237.1	185.2	1,088	762
Apr.	234.7	187.8	1,093	727
May	233.1	194.8	1,121	785
June	....	202.4	....	781
July	....	165.5	....	920
Aug.	....	218.4	....	1,009
Sept.	....	198.7	....	993
Oct.	....	211.8	....	1,018
Nov.	....	193.8	....	1,034
Dec.	....	212.9	....	1,007
Total	....	2,275.9	....	....

American Institute of Steel Construction

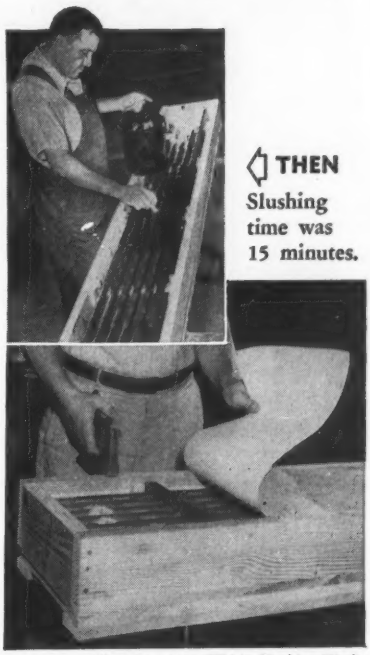
Construction Valuation

(37 States)—In Millions of Dollars

	Total		Building	
	1951	1950	1951	1950
Jan.	1,043.2	730.9	881.9	578.8
Feb.	1,140.5	779.5	962.3	627.0
Mar.	1,267.4	1,300.2	1,043.8	1,075.3
Apr.	1,375.0	1,350.5	1,108.9	1,123.5
May	2,573.0	1,347.6	2,295.0	1,083.0
June	1,408.9	1,345.5	1,098.4	1,072.0
July	.....	1,420.0	.....	1,162.2
Aug.	.....	1,548.9	.....	1,295.1
Sept.	.....	1,286.5	.....	1,048.3
Oct.	.....	1,135.8	.....	956.7
Nov.	.....	1,087.1	.....	931.6
Dec.	.....	1,169.4	.....	969.0
Total	.....	14,501.1	.....	11,922.5

F. W. Dodge Corp.

Packaging Time cut 60% with Angier VPI* Wrap



THEN Slushing time was 15 minutes.

Photos courtesy Whitin Machine Works

NOW only 6 minutes are required to line box with Angier VPI Wrap. This revolutionary coated paper gives off vapor that stops rust. It eliminates slushing. "Degreasing" time saved per box — one hour. Total time saved per month — 460 hours. To simplify packaging of *your* metal products, send coupon today!

Angier CORPORATION
Framingham 8, Mass.

*T. M. Reg. U. S. Pat. Off. (Vapor Rust Preventive)

Industrial Packaging Manufacturers & Engineers Since 1895
Representatives & Distributors in Principal Cities

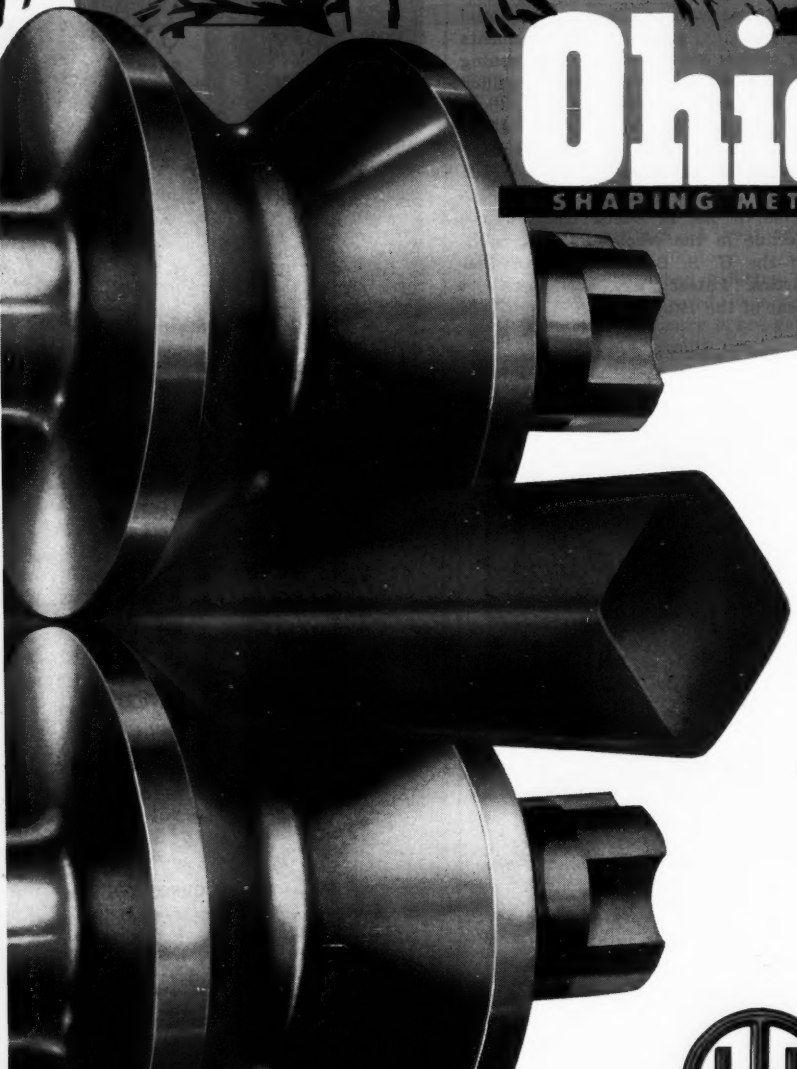
Angier Corp., Framingham 8, Mass.
Yes Send VPI Facts! I am interested in rust control of:

( ) Machinery - Industrial, Metal Working, Farm, Office, Construction.
( ) Electrical Machinery, Appliances, Products.
( ) Fabricated Products—Cutlery, Hardware, etc.
( ) Transportation Equipment—Aircraft, Auto, Naval, Railroad, etc.
( ) Steel in process of fabrication.
( ) Instruments and clocks.
( ) Ordnance Equipment.
( ) Others:

(USE MARGIN for name, title, firm, address)

Ohio Roll

SHAPING METAL FOR ALL INDUSTR

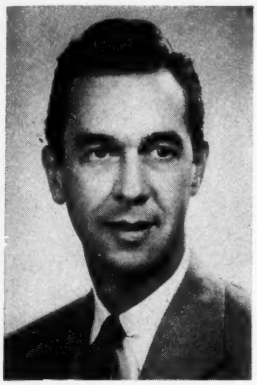


At Ohio Steel our system of
INTEGRATED PROCESS CONTR
contacts every phase of
manufacturing and testing. Engine
follow and chart performance
records of every roll that lea
our plant. This data is collected
into a roll history and preser
in Ohio Steel files along wit
manufacturing and testing record
of the roll. Roll histories,
production information, research
findings and anything learned
from rolls bought as scrap,
provide PROCESS CONTROL w
material for improving
manufacture of Ohio Ro

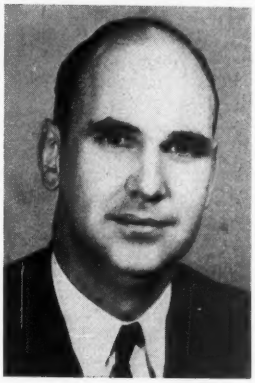
THE OHIO STEEL FOUNDRY CO. LIMA, OHIO

PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry



ALFRED G. DENNISON
. . . . heads sales at Riverside Metal



VERNON E. HENSE
. . . chief metallurgist at Buick

A. H. BORCHARDT
. . . a V. P. of Worthington Pump

Alfred G. Dennison was promoted from assistant sales manager to general sales manager of **Riverside Metal Co.**, Riverside, N. J., replacing **Fred M. Shelley Jr.** who will return to his former post as district manager of Newark, N. J., territory.

Kaiser Steel Corp., Oakland, Calif., appointed **Brooks Kitchel** purchasing agent, Fontana, Calif., plant, to replace **R. N. Sturtridge**, resigned. **E. W. Holbrook** succeeds Mr. Kitchel as superintendent of stores.

Donald N. Cleary was promoted to production manager, and **John S. Randall**, formerly with Superior Separator Co., was made plant manager of **Frank G. Hough Co.**, Libertyville, Ill.

Frank J. Byrne was appointed assistant manager of sales for the steel strapping division of **Brainard Steel Co.**, Warren, O. He formerly was a company sales representative in the Cleveland district. He joined Brainard, Sharon Steel subsidiary, late last year.

Robert E. Breit was appointed traffic supervisor of the Milwaukee works of **International Harvester Co.**

Buda Co., Harvey, Ill., elected **L. F. Shoemaker** as a vice president. He started with the company in 1920 and recently has been sales manager.

Marquardt Aircraft Co., Los Angeles, appointed **John M. Rogers** assistant to President **Roy E. Marquardt.** He was formerly vice president and director of military sales, Douglas Aircraft Co., Santa Monica, Calif.

Vernon E. Hense was appointed chief metallurgist at **Buick Motor Division** of General Motors Corp., Flint, Mich., succeeding **Robert B. Schenck** who retired. Mr. Hense was formerly assistant chief metallurgist.

Ellen G. Ingalls has been named president and chairman of the board, **Ingalls Iron Works Co.**, Birmingham; board chairman of Ingalls Ship Building Corp., Pascagoula, Miss.; and president of Steel Construction Co., Birmingham. She succeeds her husband, the late **R. I. Ingalls. M. F. Pixton,** vice president and treasurer, was designated chief executive officer.

Leo Martin joined **Flexible Tubing Corp.**, Branford, Conn., as machine design engineer and **James W. Hull** as chief of the chemical laboratory.

William K. McGreevy was appointed sales representative of the Pittsburgh regional office of the Philadelphia division, **Yale & Towne Mfg. Co.**

William A. Mallory was named manager of mechanical connectors department for **National Electric Products Corp.**, Pittsburgh. He also will assist in managing the company's busway department.

Wallace M. Loos, formerly manager of stainless steel sales, **Carpenter Steel Co.**, at its plant in Reading, Pa., was promoted to manager of mill products. He is succeeded by **Harold A. Brossman,** who in turn is succeeded as manager of alloy steel sales by **Howard M. Goodman. Robert F. Koch** was promoted to assistant manager of stainless steel sales.

A. H. Borchardt was elected a vice president of **Worthington Pump & Machinery Corp.**, Harrison, N. J. Associated with the company many years, his most recent position was assistant vice president and manager of centrifugal pump application and sales division.

Roy W. Johnson was appointed executive vice president of **Republic Supply Co. of California,** Los Angeles. He was formerly general sales manager and will be succeeded in this position by **W. Dale Russell,** senior vice president.

Walter B. Siegel was appointed general personnel and industrial relations manager for the **Soule Steel Co.**, San Francisco. Mr. Siegel, who was formerly with the Owens-Illinois Glass Co., will make his headquarters in San Francisco and will be active also at Soule's Los Angeles and Portland, Oreg., plants.

Harold A. Miller was appointed general staff manager, general sales department, **United States Steel Supply Co.**, Chicago, warehousing subsidiary of U. S. Steel Corp. He succeeds **W. C. Etheredge,** who joined the price division, commercial department of U. S. Steel at Pittsburgh.

Weber Aircraft Corp., Los Angeles, subsidiary of Weber Showcase & Fixture Co. Inc., elected **Charles B. Buckley,** formerly general manager of Weber's aircraft division, and **Arnold Johnson,** formerly works manager at Weber Showcase, vice presidents.

Robert B. Mounsey, formerly of magnesium technical service and development, **Dow Chemical Co.**, Midland, Mich., was named magnesium sales

representative in Dow's Cleveland office.

William E. Saupe was appointed operation manager and **Will Pruessman** was named manager of manufacturing of the Schenectady steam turbine and generator divisions of **General Electric Co.**, Schenectady, N. Y.

James W. Kent, formerly supervisor of material control at the Fontana plant of **Kaiser Steel Corp.,** was appointed buyer, scrap procurement, at the Los Angeles district sales office. **Curtis Bonneville** was appointed general foreman of the merchant-skelp mill at the Fontana, Calif., plant.

J. C. Hammel was appointed manager of accounting, a newly created position of **Oglebay, Norton & Co.,** Cleveland.

Louis G. Hehman was elected vice president of **Luria Steel & Trading Corp.,** New York.

New officials at **Acro Welder Mfg. Co.,** Milwaukee, are: **Desmond Stolz,** vice president, who continues as works manager; **J. T. Collins,** chief sales engineer; **E. W. Bruss,** chief electronic engineer; **W. R. Hoff,** comptroller; **W. C. Conarchy,** resale parts and service manager; and **R. L. Sutton,** chief draftsman.

Thomas E. Wilson was appointed production manager of the GMC Truck & Coach division, **General Motors Corp.,** Pontiac, Mich. **Earl A. Maxwell** will succeed Mr. Wilson as director of personnel.

Walter L. Luli was named chief engineer of the coach division of **White Motor Co.** His headquarters are at the coach plant, Cleveland. **William G. Sternberg** was elected a vice president, in charge of the Sterling Division. He was president of Sterling Motor Truck Co., Milwaukee, which firm was acquired by White and which is now a division of the company. Other appointments to the Sterling Division are: **Ernest R. Sternberg,** named general manager, and **J. P. Dragin,** appointed vice president in charge of finance.

W. H. Neptun was promoted from assistant factory manager to factory manager of **Hyster Co.'s** Peoria, Ill., manufacturing plant.

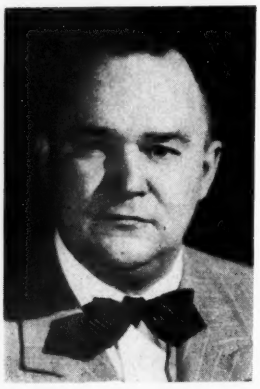
R. L. Howes was named manager of quality and standards, a new activity of **General Electric Co.,** X-Ray department, Milwaukee. He is succeeded by **Richard C. Ehrman** as manager of employee and community relations.

Roger H. Brown was appointed eastern district manager for the **Warner Electric Brake & Clutch Co.,** Beloit, Wis. He formerly had been in charge of the company's operations in New York, Philadelphia and Washington.

Douglas Aircraft Co. Inc., Santa Monica, Calif., appointed **John C. Buckwalter** chief engineer of the Long Beach division, succeeding the late **Fred J. Stineman.** Mr. Buckwalter was formerly assistant to vice president-engineering.

Two plant superintendents appointed by **National Lead Co.** are: **William F. Jones,** promoted to superintendent of the Boston plant to succeed **Herbert Shattuck,** retired; and **Harvey Morgan,** named superintendent of the Buffalo plant.

Robert N. Nelson was named assistant sales manager, pneumatic division, **Sundstrand Machine Tool Co.,** Rockford, Ill.



WALTER L. LULI
. . . chief engineer, White coach div.

WILLIAM G. STERNBERG
. . . V. P. White Motor Sterling Div.

WALTER T. MORELAND
. . . Lone Star Steel V. P.-sales

Lone Star Steel Co., Dallas, elected **Walter T. Moreland** to a new post, vice president in charge of sales, and named **John B. Connally Jr.** to its group. Mr. Moreland has served as general sales manager since May, 1950.

Harry T. MacMillan was appointed western service engineer, **Thomas Associates,** Los Angeles.

John M. Martin was named assistant general manager of the explosives department of **Hercules Powder Co.,** Wilmington, Del.

Ralph C. Edgar was appointed director of industrial, personnel and public relations for **Ball Brothers Co. Inc.,** Muncie, Ind., and its subsidiaries. Mr. Edgar resigned as personnel director for Allegheny Ludlum Steel Corp., Pittsburgh, to join Ball.

C. S. White was appointed manager of the eastern division of **Dearborn Chemical Co.,** with headquarters in New York. He succeeds the late **Herbert J. Cornell.**

Lawrence H. Smith was appointed executive vice president, **Chicago Steel Tank Co.,** Chicago, recently acquired by Pressed Steel Car Co.

R. G. Sullivan was placed in charge of the expanded West Coast operations of **Reeves Pulley Co.,** Columbus, Ind.

A. R. Booker was elected executive vice president and general manager of **Electrofilm Corp.,** Los Angeles, to succeed **W. G. Andrews,** resigned.

Herbert E. Gallison was appointed manager of the industrial mixer sales division, **Worthington Pump & Machinery Corp.,** Harrison, N. J., with headquarters at the Dunellen, N. J.,

ROUND AND SHAPED TUBING

(.010" to ⅜" O.D. Max. Certain Analyses .035" max. wall to 1⅜" O.D.)
Available in:

Carbon Steels:
A.I.S.I.—C-1008, MT-1010, MT-1015, C-1118, MT-1020, C-1025, C-1035, E-1095

Alloy Steels:
A.I.S.I.—4130, 4132, 4140, 4150, 8630, E-52100

Stainless Steels:
A.I.S.I.—303, 304, 305, 309, 310, 316, 317, 321, 347, 403, 410, 420, 430, 446, T-5

Nickel Alloys:
Nickel, "D Nickel"*, "L Nickel"*, "Monel"*, "K Monel"*, "Inconel"*, 30% Cupro Nickel, 18% Nickel Silver.

Beryllium Copper.

*Reg. U. S. Trademark International Nickel Company

The HOLE Story —by— Superior

Chapter 2

The Bubble That Beats Trouble to the Punch

In science, the arts and industry, fine small tubing serves many purposes, from the hypodermic injection of healing drugs to the control of hydraulic presses that produce airplane and tank components.

In every tubing job there is one prime requirement. The tube must not leak. Here at Superior we specialize in the production of high quality tubing in all practical metals . . . and we use many methods to insure the superiority of our product.

Precision gauges in the hands of experienced inspectors check for dimensional precision. High powered microscopes in our laboratories investigate grain structure. Chemical analysis maintains close control on metallurgy. And in our shops compressed air, under pressures to hundreds of pounds per square inch, is forced into tubing held under water to make sure that leaks are detected and eliminated.

The whole story of Superior is one of quality . . . in machines and methods, in men, and in the end result —fine small tubing to do tough jobs well.

This is a story with continuity, for our aim holds always to raise the standards by which we judge Superior tubing . . . and to continue to increase the rate at which we produce it to meet your demands.

SUPERIOR TUBE COMPANY, 2005 Germantown Ave., Norristown, Pa.

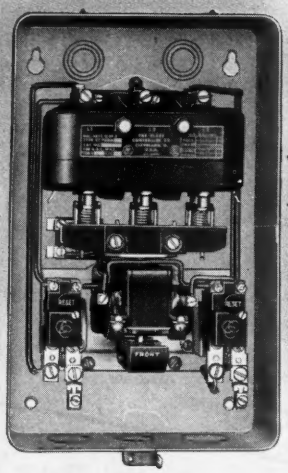
West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. UNderhill 0-1331.

Superior
THE BIG NAME IN SMALL TUBING

All analyses .010" to ⅜" O.D.
Certain analyses (.035" max. wall)
Up to 1⅜" O.D.

Setting new standards in starter performance

The CLARK TYPE "CY" AC MAGNETIC MOTOR STARTERS with the NEW ARC QUENCHING PRINCIPLE



These rugged magnetic starters provide the extra protection and dependable operation of "Mill-Type" heavy-duty construction and design.

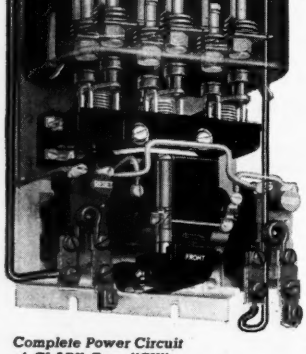
- **No tools needed to inspect contacts. Contacts, coils, and stationary magnet frame easily removed.**
- **Melting alloy-type overload relays.**
- **Vertical lift clapper type magnet adapted to straight line guided movement, uses no springs.**

another CLARK first!

The CLARK Type "CY" Starters feature the combined use of strong multi-turn magnetic blowouts with twin-break contacts.

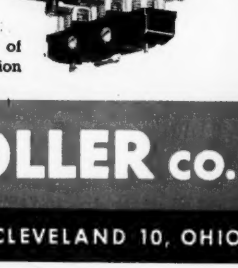
The Type "CY" starters employ an entirely new principle of arc interruption. The blow-out coils are concentric with the contacts. The magnetic field quenches the arc either by lengthening or confining it. By forced rotation the arc moves continually from a hot to a cold spot—minimizing burning or pitting of contacts. The solid upper arc shield prevents the accumulation of hot gases between wiring terminals—minimizing phase-to-phase failures*.

All parts in the arc chamber are copper, brass and steel, thus preventing carbonization. Absence of carbon and soot means longer contact life and lower operating temperatures.



Complete Power Circuit of CLARK Type "CY" Starter, Size 2

Phantom View Showing Arc Shield



*Magnetic blow-out coils are used on all size 2 and 3 Type "CY" starters. Mill-Type construction is used on sizes 0 and 1.

Let a CLARK application engineer show you what this new line of CLARK Type "CY" starters means to you in increased production and lower maintenance.

THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1142 EAST 152ND STREET, CLEVELAND 10, OHIO

JOSEPH N. RYDER
. . . United Mfg. sales mgr.

M. W. TOWNSEND
. . . directs sales, Handy & Harman

VINCENT LYSAGHT
. . . AC&C Helicoid Gage sales mgr.

plant. He succeeds **J. C. Lukas,** resigned.

United Mfg Co., Bedford, O., appointed **Joseph N. Ryder** as sales manager. Mr. Ryder joined United Manufacturing about a year ago.

Handy & Harman appointed **M. W. Townsend** to take over the direction of sales for products used in the arts and industrial fields. His headquarters will be at the company's general offices in New York. He was assistant to vice president—sales.

Vincent Lysaght was appointed sales manager of the **Helicoid Gage Division,** American Chain & Cable Co. Inc., Bridgeport, Conn. He was formerly sales manager of Campbell Machine Division and Wilson Mechanical Instrument Division.

OBITUARIES . . .

Alfred G. York, 57, a director and vice president of **Watson-Stillman Co.,** Roselle, N. J., died July 22. He had been associated with the concern since 1918. In 1941 he became vice president and general sales manager, and in 1945 was elected to the board.

Chester P. Clingerman, 67, who retired six years ago as superintendent of U. S. Steel Co.'s **Carrie Furnaces,** Rankin, Pa., died July 22. He had served as superintendent for 20 years before retirement.

W. Wallace Kellett, 59, president, **Kellett Aircraft Corp.,** North Wales, Pa., and a director and former board chairman of Republic Aviation Corp., a pioneer in autogiro and helicopter production, died July 22. He founded Kellett Aircraft in 1928 and remained its president for 23 years.

Joseph H. Towle, 62, in charge of the Philadelphia office of **Tool Steel Gear & Pinion Co.,** Cincinnati, for over 20 years; senior member and founder with his late father of **Towle & Son Co.** of Philadelphia, died July 12 in Philadelphia.

Raymond J. Southwell, 64, formerly general sales manager of **Wickwire Spencer Steel Co.** of New York and the **Andrew Campbell Division** of American Chain & Cable Co., Bridgeport, Conn., died July 14 in Bridgeport.

Ralph S. Fetter, 69, president and general manager of the **Fetter Steel Barrel Corp.,** Buffalo, died July 16.

George G. Heidlauf, former vice president of **Smith & Caffery Co.,** Syracuse, N. Y., died July 16. He had retired from the company last August.

Frederick T. Holliday, 52 president of **Monarch Steel Co.,** Hammond, Ind., and vice president of **William J. Holliday Co.,** Indianapolis, died July 15 in Indianapolis.

C. A. Schiebert, 41, president and a founder of **Metal Stamping & Engineering Co.,** Milwaukee, died July 18.

Edward Rogan, 71, retired mill superintendent for **Habirshaw Cable & Wire Corp.,** Yonkers, N. Y., died July 21.

Clarence D. Carlson, 68, sales engineer, **Nottingham Steel Co.,** Cleveland, died July 22.

Ralph H. Whisler, 64, chief experimental engineer for **Hudson Motor Car Co.,** Detroit, died July 9.

Arthur A. Schrage, 71, vice president and general manager of **Detroit Steel Corp.,** Detroit, until he retired in 1944, died July 11.

J. Fred Mowat, 68, a member of the engineering department, **United States Steel Corp.,** Chicago, died at his home in La Grange, Ill., July 18.

Peter Kruse, 77, chief engineer and designer for the Hamilton-Kruse branch of the **Baldwin-Lima-Hamilton Corp.,** Hamilton, O., died July 16 at his home in Brooklyn, N. Y.

Fred H. Brussel, 61, owner of **Central Pattern Mfg. Co.,** Detroit, and **Numatic Mfg. Co.,** Milford, Mich., died July 16 in Milford.

Samuel S. Ireland, 70, who founded **Rolled Metal Products Co.,** Toronto, Ont., in 1921, and headed it until retirement a year ago, died July 17.

Arthur J. Thompson, 54, president, **Endicott Forging & Mfg. Co.,** Endicott, N. Y., died July 18. He was named president in 1947 and was formerly comptroller.

Walter E. Spindler, 65, president, **Aluminum Specialty Co.,** Manitowoc, Wis., died July 20.

Carl W. Benz, executive vice president, **International Railway Car & Equipment Mfg. Co.,** Kenton, O., died July 15 in his home in Hammond, Ind.

We have the "KNOW-HOW"

and the "KNOW-WHY"

when it comes to WELDING

33 years of welding and fabricating experience, plus a complete designing, engineering and metallurgical service, put us in a position to help YOU with YOUR problems where fusion or resistance welding applies to either ferrous or non-ferrous metals.

We'll be glad to send our illustrated catalog. Just drop a line to our Products Development Division.

THE AMERICAN WELDING & MANUFACTURING CO.

110 DIETZ ROAD • WARREN, OHIO

Production AND Engineering
NEWS AT A GLANCE

OXYGEN BLAST FURNACES—Two 100-ton low-shaft oxygen-enriched blast furnaces are being erected in Europe, one at Oberhausen, Germany, and the other at Ougree, Belgium, under sponsorship of the Office of European Economic Co-operation (representatives of European countries receiving Marshall Plan aid). Eight countries are joining in the research program tied into the two furnaces, some results being expected from the German installation this fall. Described by European scientists as the "first international research project in metallurgy", the undertaking drew refusals from several U.S. steel companies which had been invited to participate.

ANNEAL IN VACUO—Bright annealing in an electric furnace without the need for a protective atmosphere can be accomplished by means of placing parts in hermetically sealed pots and connecting the latter to a vacuum pump before placing in the furnace. Equipment is described in the British industrial press where it is noted that any drawing compound present on the parts will be extracted by the pump which can be continued in operation during the annealing cycle.

14,000 PAGES ON ONE STAMP—New technique in high resolution photography permits reducing the size of a typical book page of print to proportions making it possible to accommodate 14,000 complete pages on an area the size of a postage stamp. The system is the result of 17 years of research by a British scientist, now in this country. Another of his novel brain children is a linear scale, made in lengths up to 2 feet, accurate to within 0.00003-inch in the overall length. It carries lines spaced at 0.001-inch and is numbered at intervals of 0.050-inch.

CLEAR OIL FOR GRINDING—Transparent soluble oils, as against soluble oil emulsions, are normally "synthetic detergents" since they contain no petroleum-type oils. They are expensive, two to four times the cost of mineral oil type soluble oils. Like all detergents, they have excellent cleansing or washing ability, washing away lubricating oils on moving surfaces and causing sticking if allowed to come in contact with such surfaces. For this reason the use of transparent soluble oils usually is confined to certain types of grinding operations, or on certain machine tools where there is no danger of washing out lubricating oil.

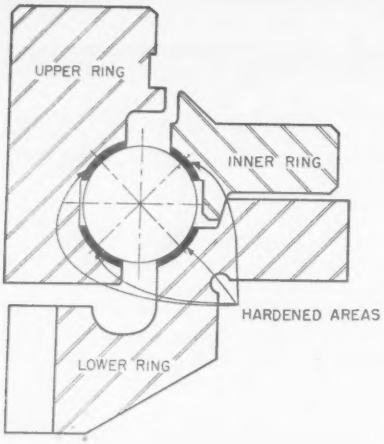
SHAPE AFTER ENAMELING—Porcelain enameled steel that can be formed after firing, a long-sought goal, is in process at the plant of a leading stove manufacturer. Key to the method is a thin coating, only 0.003-inch thick. Liner panels of 24-gage steel, for example, are placed on a cable conveyor, coated on one side by an automatic spray and a light reinforcing coat applied by hand sprayers to the ends which become sides after forming. Following firing, the panels can be stored in the flat until required in the fabricating line where the only precaution is the provision of a fairly large radius of curvature for 90-degree bends.

GAS SCRUBBING—Removal of micron-size solids from effluent furnace gases by directing the latter through a venturi scrubber using high pressure water jets in the venturi throat is being accomplished effectively in a number of installations. Attractively low capital equipment costs combine with power costs somewhat on the high side. —p. 70

QUICK HARDENING RACEWAYS—Induction hardening ball races of an 80-inch turret for a new model combat tank at a speed of almost 1 inch per second made the former flame hardening arrangement obsolete in a hurry. However, design of the equipment, particularly the inductor shoes, was a tough engineering assignment. To bring 4140 steel up to the hardening temperature in the short time involved, and keep the heat concentrated on the narrow bearing area, many precautions were necessary—plus a lot of experimentation. —p. 64

ARCS HARD AT WORK—Electric steelmaking capacity by the end of last year topped 6.8 million tons annually and was still going up. There are those who think it may graze 10 million tons a year by 1953; and there are also those who would like to know where all the high-grade steel scrap is coming from to support a further increase of this handsome proportion. The answer may be some form of triplexing process involving the blast furnace and the bessemer, but it is not apparent yet. An electric furnace shop, with two 70-ton top-charge units and auxiliary equipment capable of producing 20,000 tons of carbon steel ingots a month, calls for an investment of around $2.5 million. —p. 74

DOING IT BETTER FOR LESS—Wax emulsion used in drawing hot rolled 0.030-inch stock (p. 67) has a solid content of 23 per cent, pH of 8.5, normal film thickness 0.001-inch or less, drying upon evaporation of water in 7-15 minutes and covering 2000 sq ft per gallon . . . Change from the conventional twst drill to a fluteless type with a notched carbide cutting lip (p. 80) facilitated high speed drilling through plastic materials, cutting down on heat resulting from flute loading while the carbide took care of the abrasive action of the material . . . Picking up parts coming off screw machines by an elevating belt and then dumping them onto conveyor belt fixtures for transfer through degreasing and inspection cut handling time in half (p. 68) at a camera manufacturer's plant. —A.H.A.



Sketch showing full-size cross-section of three rings comprising ball races for tank turret. Darkened areas are hardened by induction to 42-47 Rockwell C, the SAE 4140 rings untreated averaging 28-29

Induction Hardening

Concave surfaces of three 80-inch diameter SAE 4140 ball bearing races are hardened and quenched in less than 5 minutes each, replacing flame hardening

By A. H. ALLEN
Associate Editor

CRITICAL element in any combat tank is the bearing support for the turret, usually an arrangement of large-diameter balls and hardened races, the latter in the form of inserted contoured rings. Not only must a precision fit between hull and turret be maintained along with adequate support for the heavy cast armor plate turret, gun and counterbalance, but also the race surfaces must be hardened properly so there will be no "Brinelling" in transit or scoring or flaking in field service, under the worst possible conditions of dust, uneven terrain and other combat hazards. Any sloppiness in the fit between turret and hull will at once throw out the delicate fire control equipment operating the tank cannon, and might also interfere with smooth operation of the revolving turret itself.

In the T-41 Walker Bulldog light tank, the turret bearing assembly comprises three rings of SAE 4140 steel, rough and finish machined and ground to the contour shown full size in an accompanying sketch. The rings, approximately 80 inches in diameter, ride on a series of 1¼-inch ball bearings and require careful hardening of the blackened areas as shown to 55-60 Rockwell C and drawing back to 42-47. The stock averages 28-29 Rockwell C. Originally, this was done by rotating the rings under properly positioned flame hardening torches, a full circuit of one ring requiring 66 minutes—and that was considered fast time.

Equipment now has been built by the Tocco Division of Ohio Crankshaft Co., Cleveland, for doing the job by electric induction heating at a speed of 0.9-inch per second, or something under 5 minutes for a complete ring. The setup involves placing the ring in a fixture on a rotating support inclined at an angle of 15 degrees and mounting the stationary induction head inside the ring at a point about 45 degrees up from the lowest point of the circumference, this to allow ready drainage of quench solution.

The induction head is unique in design, comprising a flat L-shaped arm which can be swung up away from the ring through a crank and rack and pinion arrangement in the inductor cabinet. The arm carries a 2-inch copper shoe conforming to the concave curvature and width of the area to be hardened. The problem of creating a proper induction pattern to force flux into the ring so that it is heated rapidly to the right temperature was not an easy one to solve. A most important factor is the air gap between the inductor shoe and the ring, this being held to 1/32-inch. Hold-down rollers ride the top surface of the ring a short distance either side of the inductor to prevent variation in the air gap.

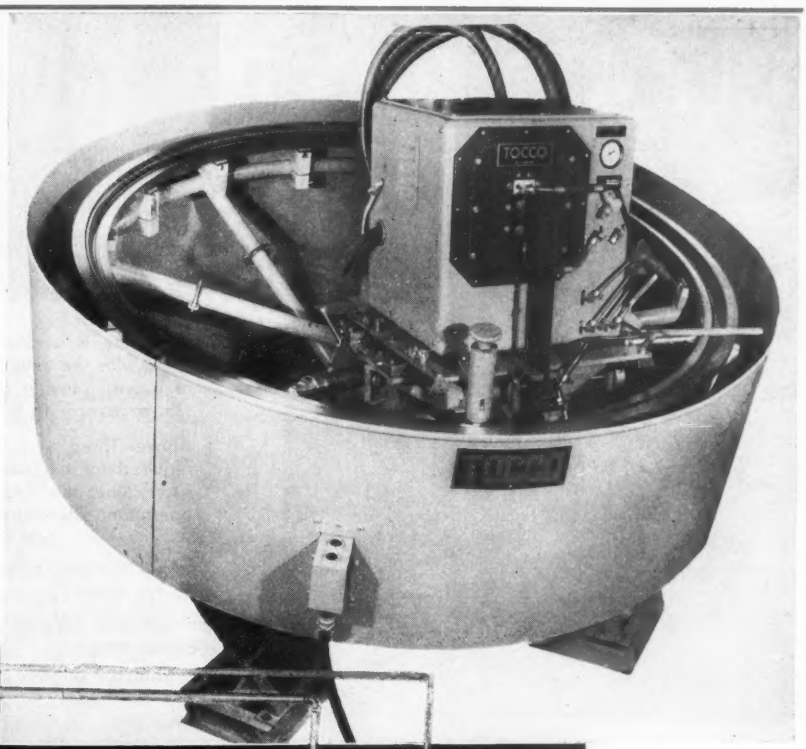
The three-rings—known as upper, lower and inner—because of their varying contours, require differently shaped inductor shoes, the upper ring, for example, having two surfaces to be hardened, the inner and lower rings only one. These shoes are quickly detachable from the inductor arm and carry on their "trailing" edge a specially drilled block through which soluble oil quench solution may be directed in 1/16-inch streams onto the heated area immediately after it passes under the inductor shoe. Pressure of 10 psi is maintained on the quench for inner and lower rings, 15 psi on the upper ring because of the dual hardened tracks.

Both the inductor arm and shoe are cored for water cooling, and a separate pumping and temperature control system is installed to supply this water at 60 psi pressure and a maximum of 80° F temperature. The same water also is circulated around the transformer supplying current to the induction head. A separate temperature control arrangement provides for maintaining the soluble oil quench solution at a constant 94° F.

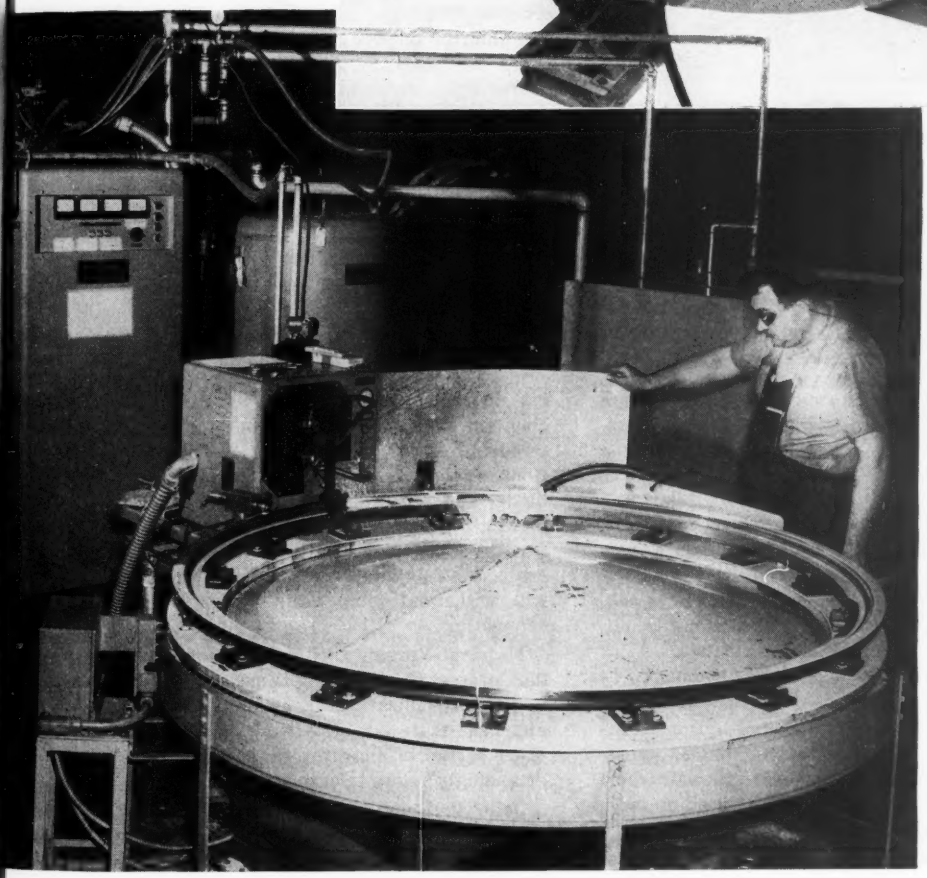
Capacity of the generator is 140 kw, sufficient to supply three induction hardening stations which eventually will be set up to handle the three rings simultaneously. The lower race requires 36 kw, the inner 35 kw and the upper 70 kw.

Control of the entire operation is through a series of conveniently located pushbuttons which provide for starting, stopping or recycling the positioned rings, and turning on or off power to the inductor.

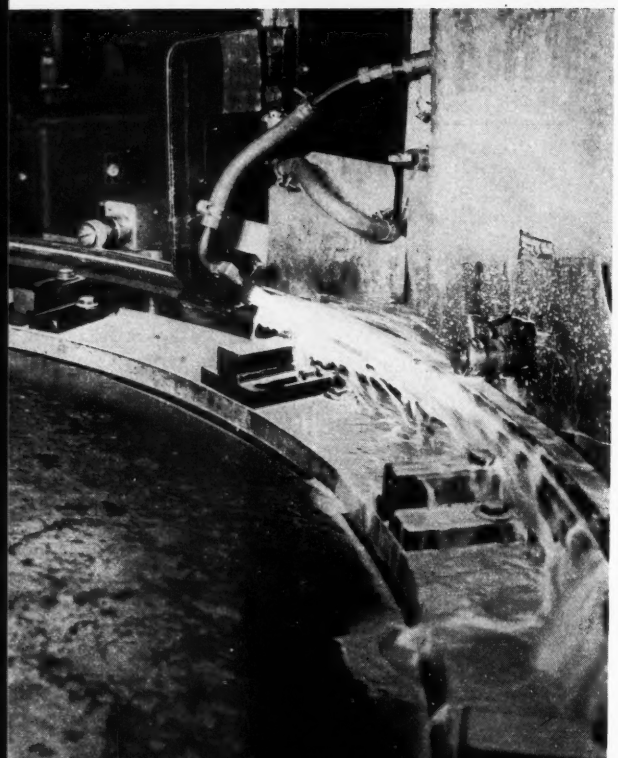
Tank Turret Bearing Rings



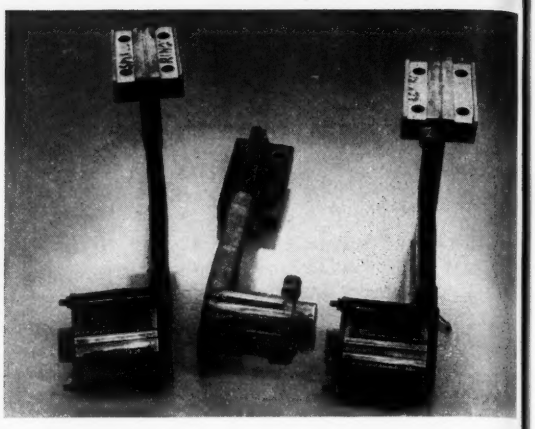
Revised design of fixture for rotating ring under induction head at speed of 0.9-inch per second. Fixture is tilted to obtain good drainage of soluble quench solution



This was the original hardening setup, with the induction head outside the ring and the fixture horizontal. In the background is the transformer which supplies current to three hardening stations. To its right is the cylindrical cooling water temperature regulator; behind the operator is temperature control tank for the quench solution



Overlap of the hardened area when the ring has made a complete circuit under the induction head must be watched closely and is held to a minimum. This was accomplished more readily than with the previous flame hardening. Control also must be exercised with regard to hardness carrying over the edges of the concave bearing areas, to avoid the danger of cracking. This overlap must not exceed ⅛-inch, with minimum of 35 Rockwell C hardness. The hardened rings are Magnafluxed 100 per cent to detect any microscopic cracks in this critical zone. Should they appear, the rings are either scrapped or reworked if possible, because small cracks of this type are focal points for fatigue failure. The rings are finish machined with an allowance of 0.030-inch of stock for removal by grinding after the hardening and drawing operations.



Left—Here is a closeup of the inductor head and shoe, with the ring moving beneath it and sprays of quench playing on the concave heated surface. Flat arm carrying the inductor shoe is water cooled

Above—Three types of inductor arms and shoes are required for the three different rings treated. The face clears the ring surface by only 1/32-inch in operation, essential to forcing sufficient flux into the steel to bring it to heat

Thin Ceramic Coatings on Turbojet Engine Parts Yield Alloy Savings

CERAMIC coatings varying from 0.0005 to 0.003-inch thick for application to jet engine components subject to heat and corrosive effects of gases have been perfected by Solar Aircraft Co., San Diego, Calif., as the result of research initiated in 1946. Solar is a large supplier of welded sheet metal elements such as combustion chambers and liners, diffuser cones, nozzle boxes, tailpipes, afterburners, exhaust manifolds and rocket nozzles, normally made of superalloys containing large percentages of nickel, chromium, cobalt, tungsten and other critically short metals. With ceramic coatings, conventional stainless steels can be substituted.

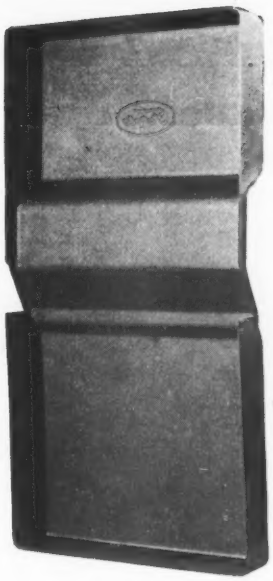
Service life of jet components coated by the "Solaramic" process also is claimed to be extended appreciably and since many of them have relatively short life stocks of spares possibly can be reduced as overhauls become less frequent.

Similar to Enameling—The process starts with mixing and melting together such ceramic materials as clay, borax and silica, the fused smelt being shattered into small pieces known as frit. As in conventional enameling practice the frit is milled with water, binder and other materials to form a paint-like coating, into which parts are dipped and subsequently fired at 1300-2400 °F. Undisclosed secret of the process is the complete composition of the coating, which will withstand temperatures of a reported 1800°F after firing.

National Bureau of Standards has developed a similar process, but Solar claims its system has more universal application, being suited to use on nearly any base material. Control of coating thickness, another virtue of the process, is said to be possible to "amazingly" close tolerances.

John V. Long, director of research for Solar, has supervised the development work on the process since its inception.

Wax Emulsions Effective as Drawing Lubricants



Auto radio casing, changed from terne plate to hot rolled pickled and oiled stock, in the drawing of which wax emulsion lubricant minimized breakage

SPECIAL wax blends for use as lubricants in metal forming operations, such as stamping, wire drawing and cold heading, are finding increasing applications, with favorable results reported. In one case, Judson & Rose Inc., Philadelphia, had been drawing terne plate into casings for automobile radios, using a 200-ton crank press with 8-inch stroke and maximum speed of 35 strokes per minute. When terne plate became scarce a change was necessary to hot rolled pickled and oiled stock, 0.030-inch thick, annealed to Rockwell B 55 and an Olsen cup test rating of 355-360. Prohibitive breakage began to be encountered until it was suggested that a wax lubricant be tried.

A creamy, aqueous wax emulsion, furnished by S. C. Johnson & Son Inc., Racine, Wis., and identified as No. 150, was rubbed well into the sheets with a cloth pad so as to break through the mill oil coat. A total of 65 draws was completed with no breakage. Engineers immediately began tests to find further application where wax lubricants might facilitate a switch to metals which are in more plentiful supply than stainless steels and alloys, for example.

Metal Flow Is Aided—It is claimed the wax compound has the ability to "stay with" the metal on which it is applied even under high heat and pressure conditions, thus facilitating metal flow during a draw to produce smooth, gall-free surfaces and well formed angles, curves and corners. In some instances it permits multiple draws without reapplication and may reduce work hardening to the point where annealing is unnecessary. It may be used in drawing, stretch forming, bending, reducing, swaging, coining and cold heading of carbon and stainless steel, aluminum and magnesium alloys. Application is by dip, spray, sponge, brush, roller coating or other common methods.

The emulsion is nonflammable, with pH of 8.5 and solid content of 23 per cent. Normal film thickness is 0.001-inch or less, drying upon evaporation of water in 7-15 minutes. Coverage is up to 2000 square feet per gallon undiluted. On less severe draws, dilution with from one to three parts water is feasible.

Where possible, precleaning and precoating of the stock will give the best drawing performance and minimum use of lubricant, also contributing to cleanliness around machines. Waxed stock should be thoroughly dry before stacking and when dry can be stacked and stored indefinitely, the film affording some degree of protection against corrosion and dirt. On simple draws where the lubricant is diluted, operations can be handled wet, although the application should be sufficiently thorough to break through any oil film that may remain on the stock. The lubricant can be removed by standard methods on conventional degreasing equipment without interfereing with subsequent paint adhesion or electroplating.

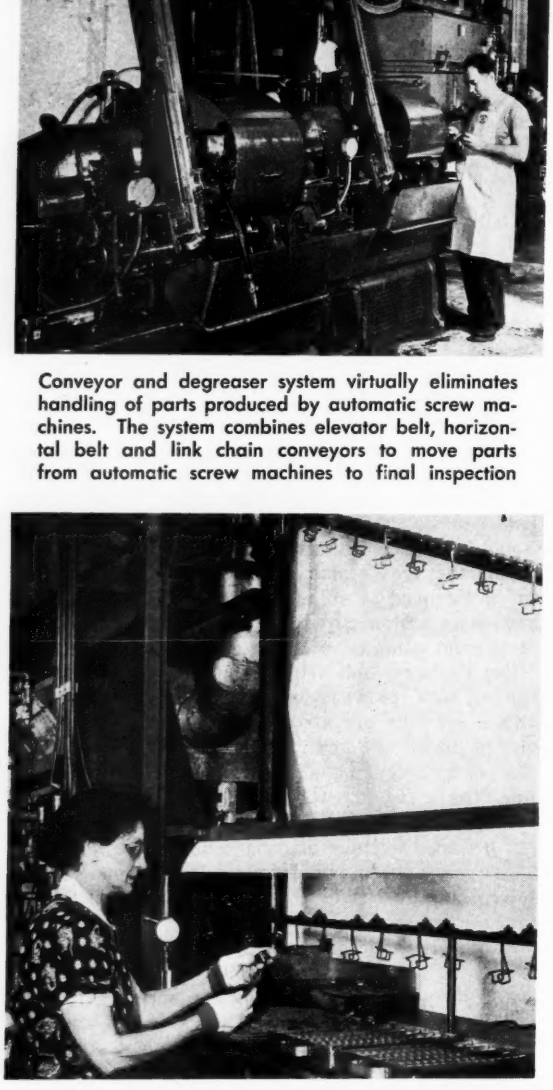
Use Paste on Bolt Wire—In a test at a plant cold heading wire for wheel bolts, experiments were made with a specially prepared paste wax, using it to coat wire in the die box and incorporating aluminum stearates as a coagulant with a small concentration of lime. As a result of this procedure, a dry wax film was applied to the wire which minimized lime flaking and provided a finish offering considerable resistance to corrosion resulting from moisture condensation during storage. Over 150 tons of wire thus treated has been processed into bolts.

Another instance showed that the torque required to drive self-tapping screws could be reduced an estimated 50 per cent by coating the screws with wax emulsion.

Tests with wax lubricants on stainless steel wire are being aimed at the elimination of copper flashing normally applied to the wire as a lubricant in cold heading, both for improving the quality of the draw and extending life of tools and dies.

CONVEYOR SYSTEM
Handles Screw Machine Parts 50% Faster

Conveyor and degreaser system virtually eliminates handling of parts produced by automatic screw machines. The system combines elevator belt, horizontal belt and link chain conveyors to move parts from automatic screw machines to final inspection



Finished parts move at convenient level over inspection bench. Parts are carried in slings on sprocket-driven link chain conveyor from degreaser

A NEW conveyor system is speeding production at Eastman Kodak Co.'s camera works. The specially designed unit eliminates much handling of parts produced by automatic screw machines used in the production of defense materials. Combining elevator belt, horizontal belt, and link chain conveyors to move parts from the automatic screw machines to the final inspection bench, the new system cuts total handling time by almost half.

A difficult handling problem connected with a daily production of several thousand parts for a Department of Defense project inspired design of the new equipment. The parts, produced from 1½-inch brass rod, are approximately 11/16-inch long. Despite their small size, each piece weighs more than a quarter of a pound—totaling up to over a ton in each daily handling.

How It Works—The conveyor system was originally conceived by screw machine department supervision. It was designed, constructed and installed by Cross Brothers Co. of Rochester, N. Y., with the assistance of the Eastman camera works plant engineering department.

Four screw machines are employed on the project. A bucket attached to the slotting arm on each machine catches the part as it is severed from the bar and transfers it to a chute. Here the part slides by gravity to a point where it is picked up by a cleat which is attached to the surface of a Plexiglas-enclosed elevating belt.

At the top of the rise a stationary cam deflects the part into another chute. It drops by gravity through a 90-degree twist and is deposited flat on an 8-inch belt which runs above the four machines served.

A tripping device at the end of the horizontal belt deposits the parts, one at a time, into swinging wire receptacles mounted on each side of a link chain. A sprocket drive moves the chain through a degreaser and then to the inspection bench. There finished parts are removed from the receptacles by hand, inspected carefully and finally stacked in special trays for shipment.

Hand System Out—Under the old system the parts were placed in baskets at each screw machine. Baskets were transported to wash tanks and dipped by hand. Next they were passed under multiple air jets to remove chips from a blind tapped hole in each part. Then came inspection for dimensional accuracy and hand filing of nicks created in handling. Finally, the finished parts were placed in special trays ready for shipment.

Kodak engineers say the new conveyor unit has been designed so that it can be adapted easily to other production setups in the plant with only minor changes.

Scorecard Simplifies Maintenance

Centralizing essential details involved in ordering, checking or identifying spare parts of rolling mill equipment eliminates needless preliminary investigation and facilitates repair programs

By VINCENT SATKOFF
Spares Controlman, Sheared Plate Dept.
United States Steel Co.
S. Chicago, Ill.

ROLLING mill maintenance usually consists of replacing worn out or broken parts with new parts. The "sledge-hammer" machinists in the maintenance gang are capable of doing the work involved in making the replacement. All that is required is the spare part. The large quantity of different parts in the equipment that constitute a rolling mill makes imperative in most cases the use of a blueprint when ordering, checking or identifying spares. The problem is to find the blueprint.

It is easy to talk about screwdown spares, west table roller brasses, hinge rollers and other parts, but selecting the correct replacement through the use of the general arrangement and detailed drawings takes time. Some of the items are superseded by those shown on another print without the fact being noted on the general arrangements, some are shown as superseded by another when they actually are not.

The Maintenance Scorecard, however, brings order out of confusion. It is a complete, simplified listing of the spare parts required for the maintenance of the equipment of a rolling mill, indexed and arranged in a systematic manner. The heading of a page of the scorecard is made up as shown below.

In the first column the spares are numbered in sequence, starting with No. 1 on Page I and continuing down the line. Under the column headed "Item" is a descriptive name of the spare. The other columns are filled in with the information requested. Under the last column, "Remarks/Job No." the location of the spare or spares is to be noted; if none are on hand, the condition of the part removed from service is to be noted, such as "broken, new gear required," or "new material ordered," and the Job Order No. The page is numbered in order.

After filling in the page number and the columns headed No., Item, B/P, Pattern and No. in Service, the sheet is reproduced in quantity. The columns headed No. on Hand, Last Date Used, and Remarks/Job No., are left blank and are filled in only on the date to be noted in the upper right hand corner.

Listed for each piece of equipment are assemblies, parts used individually, parts needed by the shop to repair the assemblies, packing, motors and any part, the lack of which causes irritation and headaches.

The index of the scorecard should be separated into two or three sections to simplify the finding of any particular piece of equipment.

Each piece of equipment is listed in the order of travel of the ingot from the soaking pit to the finishing end shipping dock. Cranes are to be listed by capacity. Some of the equipment can be broken down into units, thus making quicker and easier the selecting of the part.

Various applications of the maintenance scorecard are:

1. To enable anyone to find the blueprint for any part of the equipment of the mill, a necessary requisite for ordering, checking and identifying purposes.
2. To show the status of the spares. This necessary information is required when preparing a contemplated repairs list or making repairs.
3. To show what spares are missing so that they can be expedited.
4. To furnish the necessary information required for expediting spares.
5. To show what spares are missing so that they can be ordered if supervision calls for this action. The spares can be referred to by the number in the first column.
6. To maintain a systematic check on the spare situation by having any sheet or sheets of the scorecard filled out on request. (These sheets can be filled out directly from the inventory cards or from the cards plus a field check.)
7. To direct the activities of the spares controlman in keeping track of the spares. When filling out the sheets, he should also make or have made spare parts tags and wire them to the spares. The present location of the spare, which is not always the same as the previous location, then will always be known. Parts removed from service also can be tagged, showing the reason why it was taken out and the repair order number.
8. To know the mill. A review of the scorecard will point out the vulnerable parts of the mill where trouble might occur. The column headed "Last Date Used" will disclose how long a part has been in service and whether it is due to be inspected.

Suggested headings for plate mill scorecard

STATUS OF SPARES: SHEARED PLATE DEPARTMENT
3000—TON SHEAR—44" SLAB MILL—ARR'G'T. BP. 42338 PAGE NO.
A. MAIN 40" PLUNGER—ARR'G'T. BP. 42345 DATE:

NO.	ITEM	NO. ON HAND	BP	PATT.	NO. IN SERVICE	LAST DATE USED	REMARKS / JOB NO.

Venturi Scrubbers—Efficient, Low Cost

By W. P. JONES
Chemical Construction Corp., New York

IDEALLY suited to many jobs involving control of air pollution by removal of solids down to micron size from effluent gases, the venturi scrubber is a simple device of proved efficiency, moderate in overall cost, simple to operate and maintain. With industrial processes continually changing and the pressure against air pollution building up in many communities, the low capital investment in a venturi scrubber, as against other types of equipment giving comparable results, may appeal to managements despite the somewhat higher power costs entailed. Further, when compared with dry collection equipment, wet scrubbing methods have the added advantage that absorption of some noxious gases and odors can be effected simultaneously with collection of solids and mists. And in many cases with the venturi principle, the scrubbing solutions can be recirculated, with reduced water requirements, and the concentrations built up for return to process, for less expensive dewatering of solids, or for conditioning before discharge to sewers.

A typical venturi scrubber installation of the Pease-Anthony type is shown in the accompanying sketch. The scrubbing liquid is introduced into, or just ahead of, the venturi throat under low pressure and is distributed to give an apparent curtain of liquid across the throat. The dusty gas, at high velocity, collides with the curtain of liquid which is briefly but violently accelerated and disrupted. The gas decelerates in the diverging section and the fine particulate matter in the gas is wetted by the finely atomized droplets. Then, coalescense occurs downstream, resulting in drops of liquid large enough to be separated from the gas by centrifugal force.

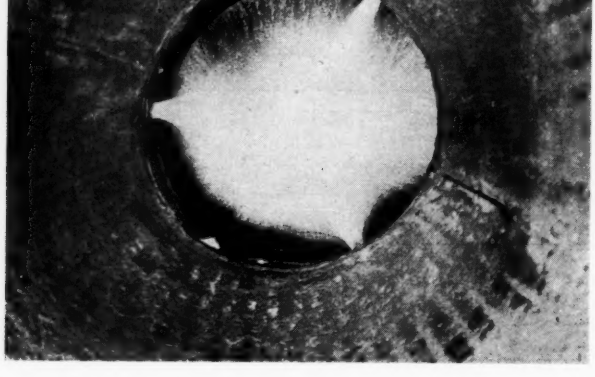
An illustration gives a look downstream into a venturi throat 5⅜ inches in diameter. Water issues as solid streams from the flush ends of 0.27-inch ID tubing perpendicular to the wall, at jet velocities of 17 feet per second. Air velocity is about 92 feet per second in this instance. Gas impinges on the upstream surfaces of the jets, seeming to part them down the middle. Drops torn off move under their initial momentum as modified by the gas velocity. Here, with low gas velocity, most of the drops are relatively large and the paths are fairly straight.

With higher gas velocities the liquid is thoroughly atomized and the initial solid jet of water is dispersed to give an apparent "coverage" in the throat. Probably the larger drops are first flattened by high velocity, then made cup-shaped. Edges of the cups are drawn out into filaments which finally break off into droplets, having at least momentarily an expanded surface area.

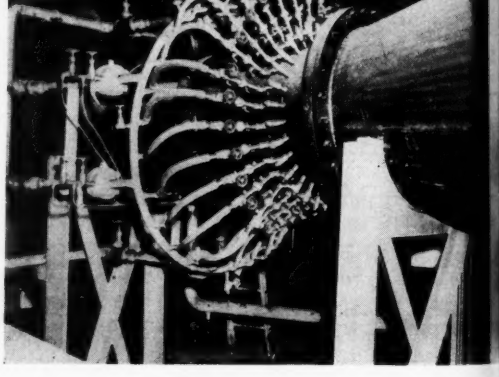
Jets on a venturi scrubber used on the effluent from an open-hearth furnace in which oxygen is injected to speed up the scrap meltdown are shown in another illustration.

An accompanying table summarizes data on dusts and fumes for three installations where the venturi scrubber has proved successful. Large particles present no problem, but small particles of the size shown

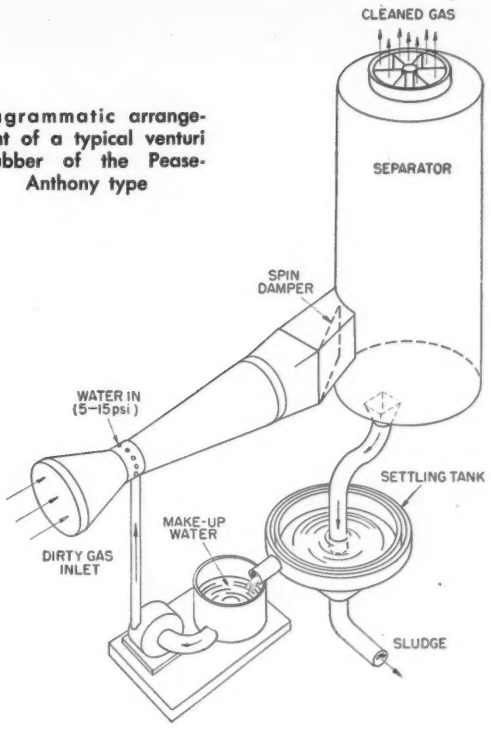
Looking downstream into the venturi throat, with high-pressure water jets in action, giving curtain effect across the opening



Multiple water jets on a scrubber handling gases from an open-hearth furnace in which oxygen is injected to speed up scrap meltdown



Lost Gas Cleaners



Diagrammatic arrangement of a typical venturi scrubber of the Pease-Anthony type

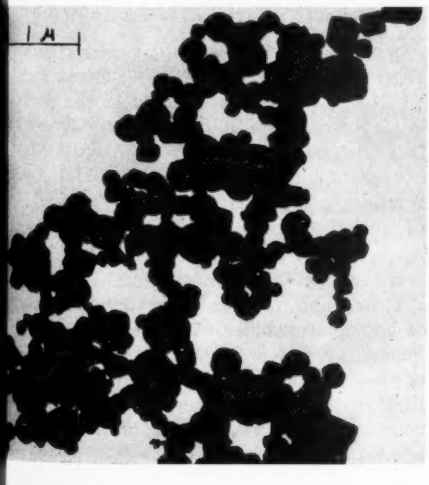
in two electron photomicrographs reproduced herewith are more difficult to collect.

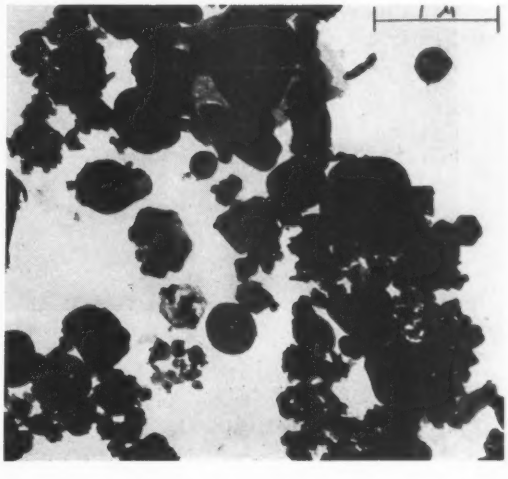
The first line of the table relates to collection of red iron oxide fume given off by the open-hearth furnace in which pure oxygen is injected by lance into the molten metal to speed up the reactions. One photomicrograph shows the original dust condition. When the venturi scrubber first went into service the improvement in appearance of the brick red cloud was spectacular. Previously, the cloud carried for miles, was a real nuisance and persisted for a matter of hours during each heat. With the scrubber, high efficiencies were realized, both by eye and on the usual weight percentage basis. During warm weather, an occasional thin pink haze comes from the stack, but during much of the time nothing can be seen. In winter, it is a pink or white mist plume which soon evaporates and disappears.

The second line of the table gives data on collection of mixed iron and zinc oxides from an open-hearth furnace in which galvanized steel scrap is charged. The other photomicrograph shows these mixed, ultrafine solids comprising the normally dense, white, sometimes brownish and reddish, cloud which pours from such a stack during the charging period. A pilot investigation on this material proved that the scrubber eliminated virtually all visible discharge.

The third line of the table refers to work on blast furnace gas. The venturi has several advantages over a primary tower-type scrubber for this service. First, it gives cleaner gas. For example, on eight sets of simultaneous inlet and outlet samples where the inlet samples ranged from 4 to 15 grains per standard cu ft, the outlet loadings ranged from 0.009 to 0.08 grains per cu ft. Second, there are no inaccessible spray nozzles to maintain, and this is important because blast furnaces must operate continuously for years. Third, the dust is concentrated into much less water, thus facilitating reclamation. From investigations thus far it appears the venturi scrubber is a superior primary washer at moderate pressure drops where secondary cleaning follows, and may combine the functions of a primary washer and a fine gas cleaner when operated at the higher pressure drops.

Consideration of experimental and plant scale work





Electron photomicrographs of dust particles, the one at the left being a sample from the open-hearth furnace in which oxygen was being injected by lance, the other from an open hearth in which galvanized scrap was being charged. Size of the particles can be judged from the scale representing one micron

DUST RECOVERY WITH VENTURI SCRUBBER

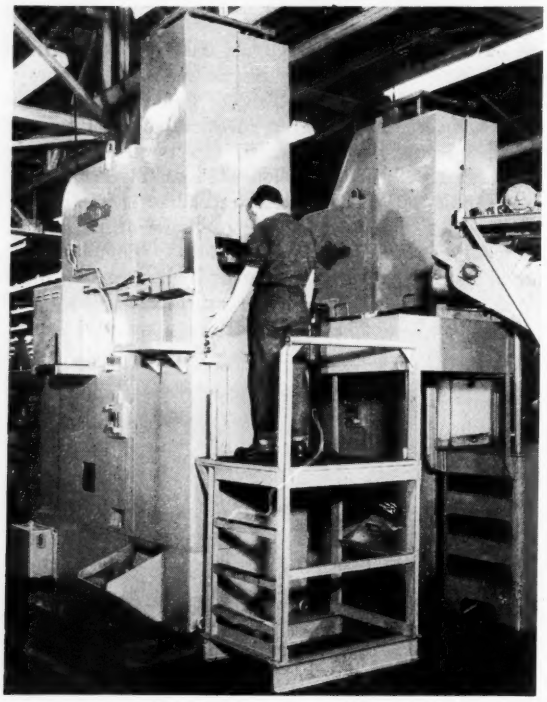
Source of Gas	Dust	Particle size, microns	Dust Loading, grains/cu ft Inlet	Exit	Average removal efficiency, %
Open hearth, oxygen lanced	Iron oxide	0.02-0.50	1-6	0.01-0.07	99
Open hearth, galvanized scrap	Iron & zinc oxides	0.08-1.0	0.5-1.5	0.03-0.06	95
Blast furnace	Iron ore and coke fines	0.5-20.0	3-24	0.008-0.05	99+

which has been done on absorption of various gases indicates that the venturi scrubber method has an interesting future where true counter-current flow is not required. The time of contact is small, it is true, but as with heat transfer and other mechanisms the turbulent high velocity mixing in the throat region yields excellent transfer effects.

Most of the pilot work has been done with a venturi scrubber discharging into a cyclonic spray scrubber, the spray nozzles of which can be operated or not. In virtually every case, when the spray nozzles were operated, some increase in efficiency was noted, but in most cases the venturi scrubber alone has given acceptable efficiencies.

High-Precision Gear Broaching

FINISHING gears to an involute tolerance of ± 0.0002-inch by broaching is something that would have been considered impossible only a few years ago. Here is a 25-ton Colonial broach installed at Chevrolet-Cleveland which processes oil pump internal gears for auto-



matic transmissions four at a time and within the tolerance mentioned. Machine, requiring only a minimum of floor space, is the pulldown type with automatic broach handling, so the operator does not have to touch the broaches. Stroke is 48 inches, with two broaches used and two parts stacked at each station. An automatic shuttle-type fixture is used which, at the end of the power stroke, shuttles toward the operator for unloading and reloading while the broaches return to the starting position. The broaches were designed by Colonial Broach Co. so as to cut the teeth and finish the inside diameter simultaneously, concentric with the outside diameter and pitch diameter. Originally it had been planned to shave the gear after broaching, but the accuracy and quality of the finish made this unnecessary.

Metal Cleaning Booklet Reissued

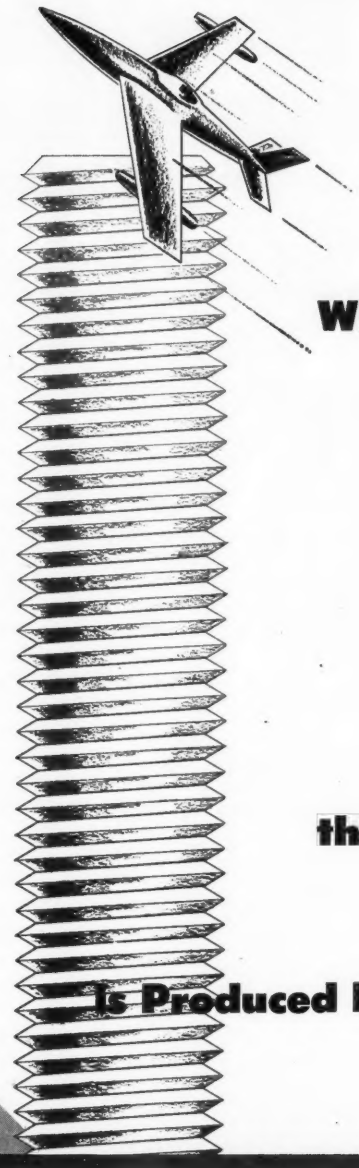
Oakite Products, Inc. announces the publication of a new edition of the 44-page illustrated booklet, "Some Good Things to Know About Metal Cleaning," reviewing metal cleaning in all its many phases. The booklet discusses the wide variety of soils resulting from such metal-fabricating processes as heat-treating, forging, rolling, stamping, drawing, extruding, spinning, grinding, machining, buffing, etc., then describes specific materials, equipment and procedures for the removal of these soils.

Among the many metal-cleaning and related operations reviewed in detail by the booklet are: Tank cleaning methods, machine cleaning methods; electrocleaning steel; electrocleaning nonferrous metals; pickling, deoxidizing, bright dipping; prepaint treatment in machines; prepaint treatment in tanks; paint stripping; steam-detergent cleaning; barrel cleaning; burnishing; cleaning in hard-water areas; treating water in paint spray booths; rust-prevention procedures; machining and grinding. Companies desiring free copies of the metal cleaning booklet may obtain them by addressing Oakite Products Inc., 134E Thames St., New York 6.

Stud Welding Manual Offered

A 32 page, pocket-size stud welding operating manual is issued for industry use by KSM Products Inc., Merchantville, N. J. Manual is directed to the operator of the equipment. Featured is a step-by-step photographic explanation of how to stud weld. The sequence includes 14 photographs of the actual stud welding process.

Other data, supplemented by appropriate diagrams and pictures, includes a description of stud welding equipment and accessories; directions for hooking up the equipment; and approximate generator and timer settings. The booklet concludes with sections on how the weld is made, types of welds you can get, and do's and don'ts of stud welding. A copy of the manual may be obtained by writing to: Engineering Department, KSM Products Inc., 6512 Park Ave., Merchantville, N. J.



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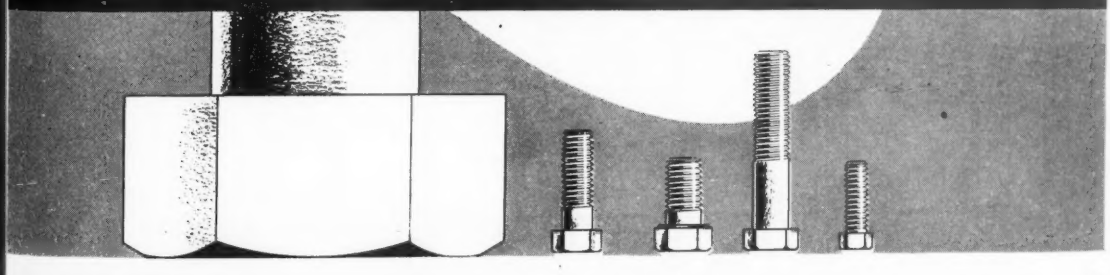


ARC FURNACE CAPACITY... A Greater Gain than Other Steelmaking Processes

Many electric furnace shops can now compete with open hearths using the cold melt process for producing rimming steels of ordinary carbon grades

A BIG EVOLUTION—perhaps even revolution—is going on in steelmaking.

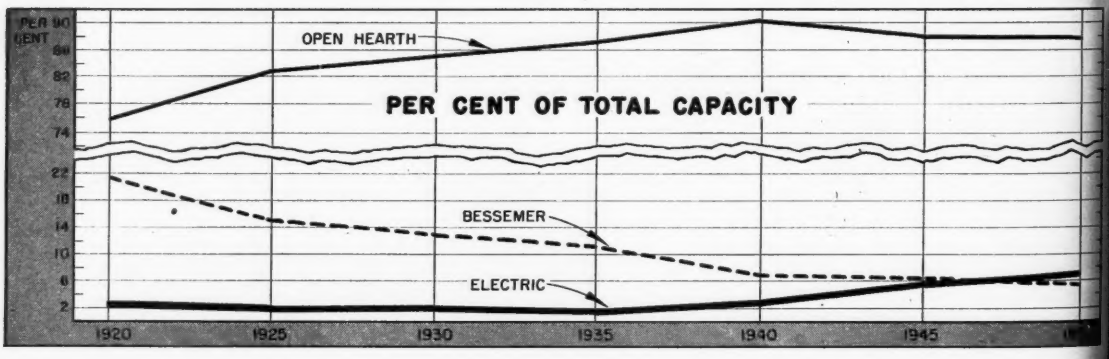
Electric steelmaking capacity in 1950, at 6,871,290 tons, was 393 per cent greater than in 1920. Open-hearth capacity rose only 78.3 per cent in that 30-year span, while the bessemer potential dropped 60.1 per cent. The accompanying chart shows the changing importance of the three major steelmaking processes over the years.

Higher and Higher—As late as 1915 annual steel production by the electric arc furnace process was only about 50,000 tons. World War I pushed production to 502,152 tons and World War II saw output soar to more than 4.5 million tons, in 1943. Last year arc furnace production hit an alltime high of 6,039,008 tons of ingots and castings. Capacity will continue to increase, to about 10 million tons by mid-1953 (see the cover).

Why the trend toward electric steel? Few proponents of the arc furnace process make the claim that electric steel generally is cheaper than the open-hearth product, although they do argue that costs for some grades are comparable. What's more, electric steelmaking is totally dependent upon scrap, one of the scarcest metalworking materials today.

The Whys and Wherefores—Despite some of the drawbacks in the technique, electric steel capacity is being increased more rapidly percentagewise than is the capacity available in any other process. Here are the major reasons why: The steel shortage has put the premium on fast expansion of steel facilities—electric capacity can be put in more quickly than open hearth or bessemer; the steel shortage has been especially severe on areas remote from big steelmaking centers—electrics are ideally suited for such regions since they thrive on small-scale production and need only scrap and electric power, not the coke, ore and limestone that those regions usually lack; an electric melt shop can be built for about half the investment required for an open-hearth shop with the same monthly ingot capacity; technological developments have made electric steelmaking more flexible and cheaper than just a decade ago.

The steel shortage has forced many companies to install electric capacity near where primary ingot facilities already exist. Those firms include West Virginia Steel & Mfg. Co., Atlantic Steel Co., Conners Steel Co. and Ingersoll Products Division of Borg-Warner Corp. Some steelmen think the electric arc process's greatest future expansion will be in the remote areas—if there's plenty of scrap and electric power. Firms that foresee a good future for electrics in distant regions include Sheffield Steel Corp. which is building at Kansas City, Mo., and Houston; Hoster Steel Corp. at Oklahoma City; Seidelhuber Iron & Bronze Works Inc. at Seattle; and R. G. LeTourneau Inc. at Longview, Tex. Like so many companies installing electrics, LeTourneau will produce primarily for its own use. Harry W.



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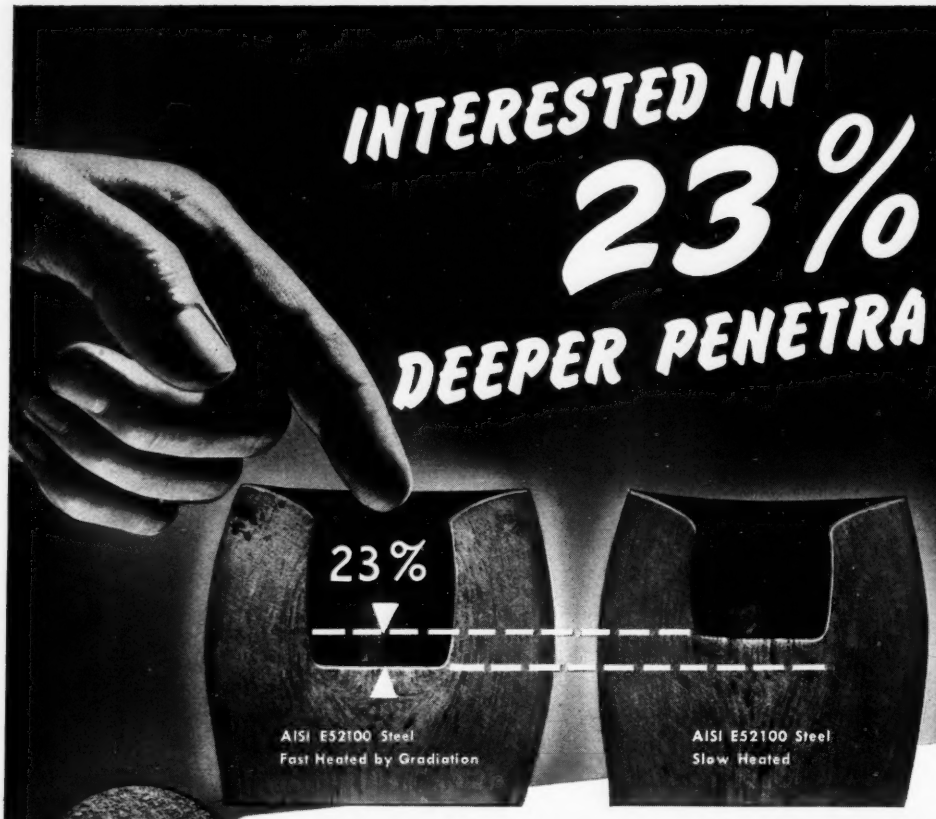
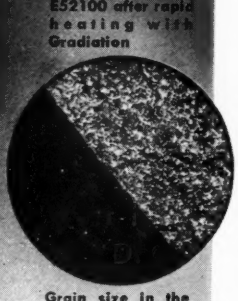


Grain size in AISI E52100 after rapid heating with Gradiation



Grain size in the same steel after conventional heating cycle

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SLUGS: 2⅛" diam. x 2½"

HEATING: to 2200°F., reducing atmosphere; *slow* —10 min.; 30 min. soak *Gradiation*— 5 min., *no soak*

EQUIPMENT: Tungsten-carbide penetrator. Hydraulic load 2,000 psi.

APPLICATION: 2 seconds, electronic controlled

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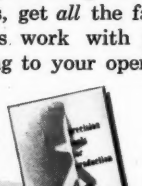

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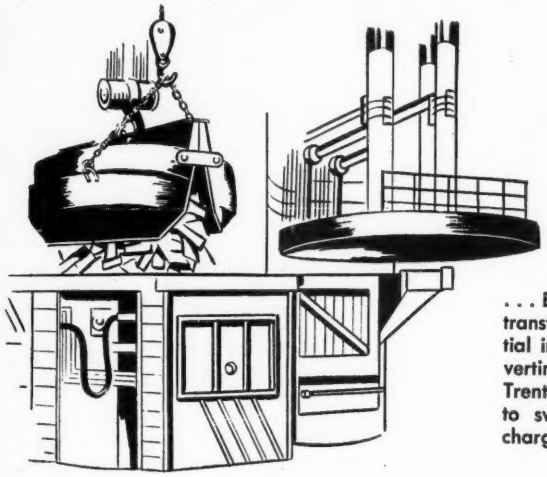
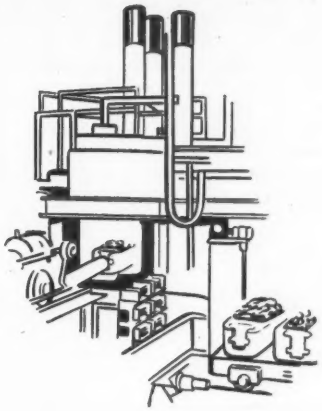
More than half of the operating time of an electric arc furnace is taken up by side-charging: Scrap is first loaded into small charging boxes that are picked up by a charging machine and emptied into the furnace. It takes from 75 to 100 boxes to supply enough scrap for one melt. Fuel costs are much greater for electric furnaces than for open hearths . . .





. . . But top-chargers and greater energy input from larger transformers are enabling electrics to offset the differential in fuel charges. So, today many producers are converting furnaces to top-chargers (McLouth Steel Corp., Trenton, Mich., is one). The top assembly can be pivoted to swing off the furnace. Then the furnace can be charged from specially built charging buckets operating on the clam principle

McQuaid, a Cleveland consultant on electrics, says: "If developments now underway to provide a lower cost-charge material are successful, there is a possibility that the position of the open hearth will be threatened in the not too distant future by the high powered modern arc furnace in all but a few large steelmaking centers."

A Matter of Money—The estimated investment (including the building) for an electric melt shop with two 70-ton furnaces is between $2 million and $2.5 million, if the facility is powered to produce about 20,000 tons of carbon steel ingots a month. An open-hearth shop to produce the same tonnage, with four 150-ton open-hearth furnaces, could be installed for a $4.5 million-$5 million investment.

Both power and electrode costs are somewhat higher for an electric furnace shop than liquid fuel costs for an open-hearth shop. Labor, refractory and other general operating costs are equal for both types of plants, given a similar annual capacity. Electrics provide a lower melting loss due to oxidation and a smaller plant carrying charge than required for the same capacity open-hearth plant. More auxiliary equipment is needed for electrics than open-hearths. Today, rimming steels of carbon grades can be made by electrics in quality equal to or better than the open-hearth product. Electrics cannot yet compete with large open hearths when blast furnace hot metal is used as part of the charge. But when medium-sized open hearths fired by liquid fuel use the cold melt process, electrics can definitely compete.

A Tale of Technology—The fourth factor behind the rise in electric steel capacity is technological change. A 70-ton electric furnace was once about as far as steelmakers could go. Northwestern Steel & Wire Co. is now building two 125-ton jobs at Sterling, Ill. Sheffield plans two 90-ton units. Bethlehem Pacific Steel Corp. likewise has a 90-ton electric a-building at Los Angeles. Timken Roller Bearing Co. will eventually have three new 100-ton units at Canton, O.

One of the proponents of electric steel—they are an articulate and enthusiastic tribe—says: "Heretofore the electric furnace was considered a process for the production of high-cost quality steel only. First to accept it for commercial production was the tool steel industry, but as experience was gained and costs decreased, its field of application expanded. Electrics made possible production of stainless steels which had not been successfully produced by any other process. Current progress is being made in electrical equipment and controls, larger transformer capacity and improved operating practices."

Acids and Basics—Acid-lined furnaces are generally

ELECTRIC ARC FURNACE STEEL
(Ingots and Steel for Castings)
Net Tons

	Annual Capacity as of Jan. 1		Annual Production as of Dec. 31
1934	1,044,867	1934	404,651
1935	1,053,370	1935	606,471
1936	1,147,221	1936	865,150
1937	1,326,788	1937	947,002
1938	1,490,858	1938	565,627
1939	1,725,086	1939	1,029,067
1940	1,882,630	1940	1,700,006
1941	2,586,320	1941	2,869,256
1942	3,737,510	1942	3,974,540
1943	4,554,980	1943	4,589,070
1944	5,350,880	1944	4,237,699
1945	5,455,890	1945	3,456,704
1946	5,500,290	1946	2,563,024
1947	5,076,240	1947	3,787,735
1948	5,396,750	1948	5,057,141
1949	6,112,870	1949	3,782,717
1950	6,871,290	1950	6,039,008
1951	7,554,610		
1952	8,860,000*		
1953	9,900,000*		

*Estimated by STEEL
American Iron & Steel Institute figures

used for producing high-quality foundry steels and both gray and white irons. Some electric shops make steel and iron in alternate heats. In our country conditions favor the acid process for foundry operation because of availability of suitable low phosphorus and low sulphur scrap. But many basic lined units are producing plain carbon alloy and manganese steels.

On ingot practice, shops usually operate with a basic-lined furnace that permits efficient dephosphorization and desulphurization to low limits. In addition to plain carbon steels, electrics are ideal for alloys such as tool and stainless steels and other products like Permalloy, nickel and its alloys, oxygen-free copper, etc. Special electric furnace equipment is used for producing ferroalloys.

A Lighter Scrap—Today, more light scrap—weighing approximately 40 to 50 pounds per cubic foot—is generated and available for melting down due to industry's tremendous use of sheet steel. Top-charged electric furnaces can be completely filled and the charge melted down more rapidly because the fluffier type scrap presents a much larger surface area to absorb radiant energy from the arcs. As a result, larger transformers (up to 25,500 kva) are today being used that can pour energy into the furnace three or four times faster than of old. Net result is more tons of finished steel per hour.

On the research front, considerable study of arc furnace electrical characteristics is being made by the American Iron & Steel Institute's committee on electric furnace steelmaking. They are delving into investigations of transformer size and voltage in relation to furnace size, optimum current control, and measurement of electrical resistance. Investigations into induction stirring of the bath may prove of practical value to all electric steel producers. Advantages claimed are less time under final slag and material reduction of oxygen and sulphur resulting in fewer nonmetallic inclusions finding their way into the finished steel. One industry authority believes that induction stirring could lessen stratification and segregation in some high alloy and stainless steel heats. While it can be an expensive proposition for the steelmakers, many believe the technique will gain some degree of acceptance in the near future.

Dust Difficulties — Investigations are also being carried out concerning dust removal for the furnace. Various methods have been studied; some engineers believe that negative pressure on the furnace dome offers the greatest possibility. Only serious drawback seems to be that the remedy burns away the electrodes quite rapidly—and, in turn, skyrockets steel production costs.

You won't be able to go out and build an electric steel plant in the backyard to supply metal for your job stamping shop. But the process does give a flexibility to steelmaking, both technically and physically. Its greatest boon now is that it offers relief from the steel shortage, particularly to areas remote from the big steelmaking centers and to those larger steel users who want to make the metal themselves.

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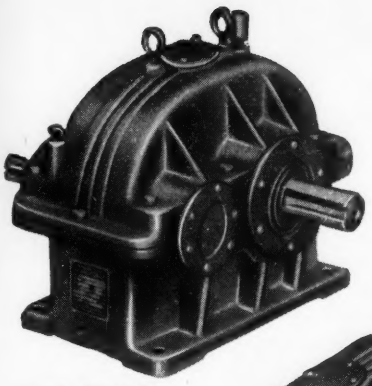
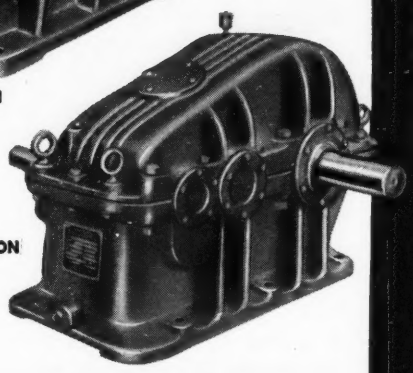
Tube Selection Aid Offered

Assistance in solving problems involving the use of alternate grades of low carbon, or carburizing grades of tubing steels, is offered in a new four-page bulletin published by the Babcock & Wilcox Tube Co. Known as bulletin TDC 149, it presents condensed data on microstructure, critical points, effect of alloy elements, forging, machining, welding and thermal treatment for 14 well-known alloy steels used in the production of tubular parts. Copies are available free on request to the company's offices.



SINGLE REDUCTION



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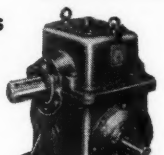

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Standard carbide tipped drill and fluteless drill before test run in melamine resin, fiber glass Micarta. Note notches in carbide cutting lip of fluteless drill

Standard carbide tipped and fluteless drills after comparative test. Loading of flutes has begun; discoloration indicates excessive heating

Fluteless Drill Cuts Plastics Faster

By R. DOUBLE
Westinghouse Electric Corp.
Pittsburgh

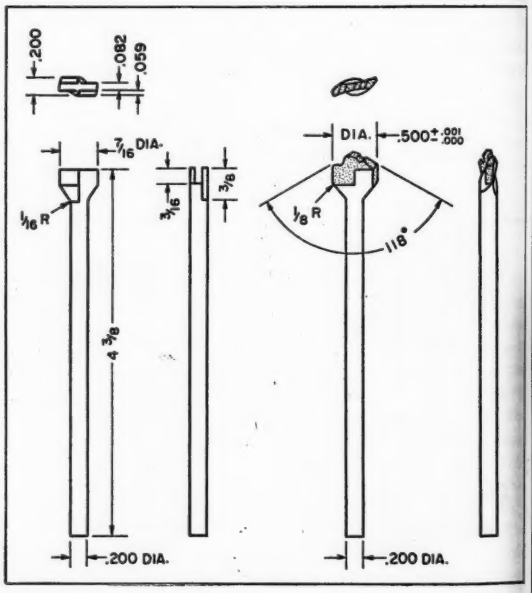
DRILLING speed up to 900 surface-feet-per-minute through plastics with little heating or abrasion is possible with a new fluteless drill developed by the headquarters manufacturing engineering laboratory of Westinghouse Electric Corp. High speed steel drills have a short life because of heating and abrasion, in the machining of all types of plastics. Heating is caused by flute loading—rapid wear by the high abrasive action of plastic materials, especially those with melamine resin or mineral fillers.

Faster Speeds—Development of the drill was no accident. To lengthen drill life between grinds, many drill firms had experimented with carbide-tipped drills. This was a step in the right direction because such a drill withstood abrasion well and allowed increased operating speeds. But the problem of excessive drill-heating caused by fluteloading remained, as did the necessity of frequently withdrawing the drill for chip cleaning.

Because Westinghouse manufactures, supplies, and fabricates plastics, the laboratory began its own development work on carbide-tipped drills, but went a step further—it eliminated the flutes. Carbide twist-drill tips were brazed into round tool-steel shanks of various diameters below actual drill size. It was found that a twist drill tip, brazed in a carbon steel drill shank that is 40 per cent of the actual drill diameter, is the most efficient in strength, chip disposal and cost. Drill bits made this way are practical for ⅜-inch diameter and all larger sizes.

Drill Cooled — Another Westinghouse development the "notched grind," is incorporated in the drill. The notched grind circulates air around the drill tip. This circulation helps expel chips and keeps the drill cool. Time is saved because it isn't necessary to remove the drill for flute cleaning—chips are left behind—and the ease of penetration allows a very rapid feed. The faster a drill is fed through the plastic, the less the tool wear, and the result is greater efficiency in tool life and productive capacity. At 1800 rpm, or 3300 rpm, a 13/16-inch fluteless drill can be shoved through the hardest and most abrasive molded or laminated plastics as fast as a man can feed the drill.

The plastics already mentioned have been drilled to a depth of 3 to 6 drill diameters without drill retraction. Since the shank diameter of the drill is 40 per cent of the drill size, up to 1¼-inch diameter drills can be used in the average No. 2 size sensitive drill press without tying up larger machines.



Schematic diagram of fluteless drill

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Because of their ability to "stay with" the metal on which they are applied, Johnson's Wax Lubricants for drawing and forming metal offer results unobtainable with conventional lubricants.

Under high heat and pressure conditions they permit unhampered flow of the metal during the draw to produce smooth, gall-free surfaces and perfect angles, corners and curves.

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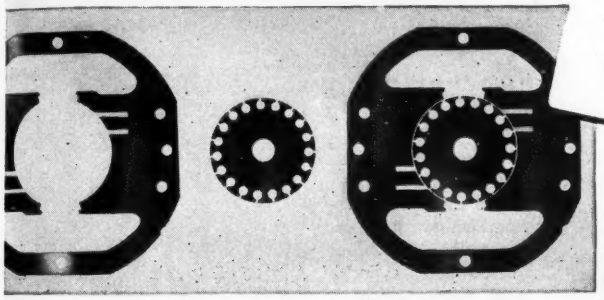
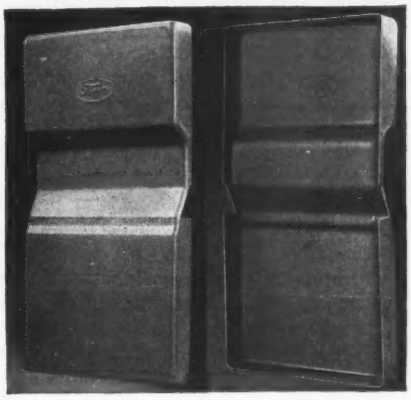
Get these benefits now!

- Multiple draws without reapplication
- Far greater die life
- Excellent results on deep, hot, difficult draws
- Suitable for nearly any draw in the shop
- Easy application by conventional methods
- Clean, safer machine and shop surroundings
- Reduced press pressures—increased pad pressures where desired
- Substantial cost savings

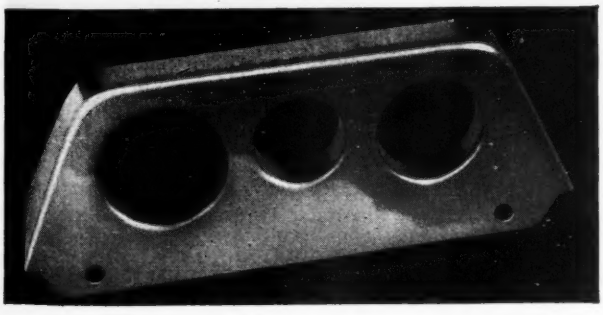


Above, Johnson's Wax Lubricant used for lamination stamping increased sets per die grind from 45,000 to 65,000.



Right, Car radio case of hot rolled steel—impossible to draw with common lubricants—perfect consecutive draws with Johnson's Wax Lubricant.

Below, Telephone coin receptacle of No. 405 stainless steel drawn with Johnson's Wax Lubricant. No perceptible tool wear after thousands of successive perfect draws.



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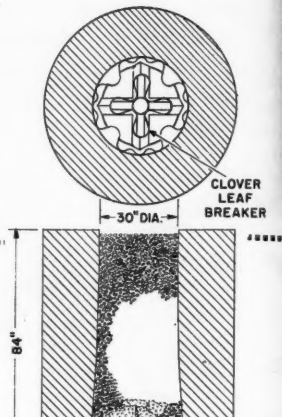
Balling drum showing the movable leveling bar with cutters at about the 10 o'clock position. The bar keeps the surface of the ore relatively smooth and at a definite thickness which eliminates production of irregular lumps and large misshapen balls

Progress Revealed in

PELLETIZING MAGNETIC TACONITE CONCENTRATE

When it became evident that agglomeration of enormous amounts of fine iron ore would be necessary if the taconites were to become an important source of iron ore for our steel industry, a resurvey of the various known methods was undertaken. While several processes were studied, this article concerns only the development of a pelletizing process as it grew out of an investigation of a 40-year old briquetting process

By E. W. DAVIS
Director
and
H. H. WADE
Assistant Director
Mines Experiment Station
University of Minnesota
Institute of Technology



Internal combustion-type pelletizing furnace used in the experiments. It is essentially a 7-foot brick-lined cylindrical shaft which is kept filled with pellets by feeding at the top

IN the pelletizing process, as in the Grondal briquetting procedure used during 1911, there are two basic steps: Molding damp ore into compacts and heating them to a high temperature. The first attempt to make taconite compacts by a continuous process was by use of an extrusion method. The product could be fired to produce good, substantial agglomerates but the equipment was awkward to operate; later a single screw, auger-type extrusion press was secured. Power taken by the auger was high, and wear on the screw and die was severe unless the concentrate was wetter than was desired for pelletizing.

A number of schemes were investigated by the Mines Experiment Station at the University of Minnesota's Institute of Technology for making extrusions including a vibration method that, for a while, seemed to offer some promise, but eventually, it was decided to concentrate attention on developments of the balling process which appears to have been originally investigated in the agglomerating field by H. J. Stehli and John E. Greenawalt some 30 years ago.

Balling Procedure—Many small tests were made before our larger balling drum was installed. This drum was 3 feet in diameter and 6 feet long. It could be rotated at various speeds and the slope could be adjusted. Equipment was so arranged that the damp taconite concentrate could be fed to the drum at the rate desired, and after passing through the drum, could be screened on a shaking screen having ¾-inch openings. Undersize from this screen was returned to the drum's feed end as a circulating load and the screen oversize constituted the finished balls. An 8 x 16-inch drum has a taconite concentrate capacity of 20 tons per hour.

Balls in proper condition for pelletizing should withstand at least a 2-foot drop to a wooden floor without breaking and with a minimum of flattening. Obviously, the larger the balls, the more difficult it is to make them strong enough to withstand this test. It is a simple matter to make strong balls 1 to 1¼ inches in diameter, but above this size, they ordinarily will not withstand rough handling.

A good ball is so tightly compacted that it cannot be made much stronger, even in a high-pressure press. This may be illustrated by dropping a ball into water and then breaking it up below the surface. Little, if any, air will appear from the inside of the ball, thus indicating that it is composed almost entirely of ore

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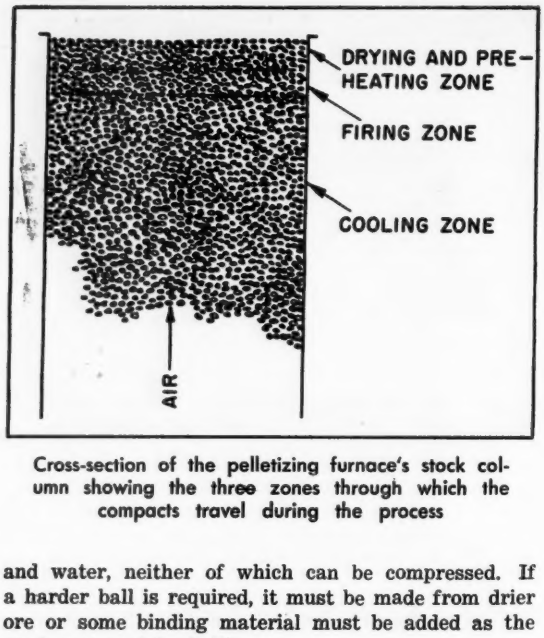


Cross-section of the pelletizing furnace's stock column showing the three zones through which the compacts travel during the process

and water, neither of which can be compressed. If a harder ball is required, it must be made from drier ore or some binding material must be added as the ore is prepared for balling.

Tests Performed—In comparing balling characteristics of various ores, two tests of ball strength are frequently made—a compression test on the wet balls as produced by the balling drum, and a compression test on the dry balls. When balls enter the pelletizing furnace, the first thing that occurs is rapid and complete drying. Since dry balls must suport a superimposed weight of new feed, their strength is important. Wet and dry strength of balls made from different magnetite ores ground to various sizes is shown in the accompanying table. Ordinarily, these tests are made on a 200-ball sample selected at random, half of which are dried before testing. Figures in the table show the weight in pounds that caused the balls to break, and average strength of the 100-ball sample, 10 strongest, and 10 weakest balls. Satisfactory furnace operation is ordinarily secured if the wet strength of the 10 weakest balls exceeds 2 pounds and the dry strength of the 10 weakest balls exceeds a pound and a half. At temperatures above 212° F the balls become stronger, and so, if they pass the dry strength test, will usually make good pellets.

Firing of the green compacts is fundamentally a very simple operation. Regardless of the compact's shape or size, it is only necessary to heat it to a high temperature—usually about 2300° F—in an oxidizing atmosphere in order to harden it. This heating can be done in any manner desired, perhaps the simplest laboratory method being to use an ordinary muffle furnace. Since the green compacts will contain several per cent of water when put into the furnace, it may be necessary with some materials to place them in the furnace's mouth for a few minutes before moving them into the higher temperature zones. Time required to harden compacts at the elevated temperature is usually only a few minutes after the whole compact has reached its top temperature. For test purposes, 20 minutes is usually considered ample. The hot compacts may then be removed from the furnace and cooled. However, they should not be quenched in water or they become brittle.

Furnace Description—The new furnace that was constructed for this type of pelletizing is shown on p. 82. It was simply a brick-lined, cylindrical shaft 7 feet high and 3 feet inside diameter. Air inlets were provided at the bottom and, below this, a circular hopper constricted the discharge of the furnace to an 8-inch diameter pipe several feet in length. At the bottom of this pipe a scrapper-type discharge mechanism was installed with variable speed and stroke. This furnace was kept filled with pellets, and as new feed entered at the top, discharge at the bottom of the seal pipe would remove pellets at such a rate as to maintain the top level of the charge at a definite elevation. The idea was to establish a burning zone at some point near the top of the column, and then, by blowing air into the bottom of the shaft, cause this burning zone to move upward. As this zone moved upward, the column of pellets would be lowered by use of the feeder, and by this means, the burning zone could be maintained at about the same elevation.

To begin with, the fuel required to supplement the heat produced by the oxidation of magnetite was added as natural gas with the air entering the furnace bottom. After many trials, it was found possible to operate on magnetite balls and natural gas, but it was discovered that operations were simpler if coal was mixed with the taconite concentrate when the balls were formed. If sufficient coal was added when the balls were formed, no natural gas or other fuel was necessary. Fuel added to the ore when the balls are made amounts to about 30 pounds of powdered anthracite per ton when pelletizing magnetic taconite concentrate, but if hematite is being agglomerated, about twice that much fuel is required.

In operation of our furnace, we found that to make hard, strong pellets it was necessary to raise temperatures to very near the fusion point. When this was done, some clusters of pellets and even clinkers were formed which could not be discharged through furnace bottom. An oscillating grate mechanism was installed at the bottom of the brick selection to break up these clusters and clinkers. This grate is actuated by a timing mechanism that causes it to turn through a small angle every few minutes. It has been quite

MAGNETITE BALLS
COMPRESSION STRENGTH IN POUNDS

Ore	Wet Balls			Dry Balls		
	Average	Strongest 10	Weakest 10	Average	Strongest 10	Weakest 10
A	2.35	2.79	2.01	0.575	0.750	0.500
AA (2# Starch)	2.53	2.92	2.20	8.45	9.90	7.45
B	3.52	4.00	2.98	1.75	1.99	1.51
C	3.19	3.48	2.60	1.15	1.32	1.00
D	4.16	4.74	3.69	2.88	3.30	2.51
E	4.44	6.10	3.10	7.06	8.60	4.21
F	3.55	4.00	3.04	3.70	4.07	3.17
FF (1½ # Starch)	3.34	3.91	2.87	6.53	7.31	5.68
G	5.00	5.68	4.50	5.30	6.23	4.42
H	2.60	3.06	2.23	2.02	2.46	1.60
HH (4 # Bentonite)	3.22	3.82	2.71	5.47	6.11	4.84
HHH (2# Starch)	2.67	3.15	2.29	5.42	6.22	4.80
I	4.57	5.09	3.89	4.91	5.48	4.39
J	3.62	4.87	2.71	2.29	3.39	1.35
JJ (5# Sodium Sil.)	3.86	5.29	3.07	5.18	7.10	3.54

AA—Same as A with 2 lbs/ton of starch added.
FF—Same as F with 1½ lbs/ton of starch added.
HH—Same as H with 4 lbs/ton of Bentonite added.
HHH—Same as H with 2 lbs/ton of starch added.
JJ—Same as J with 5 lbs/ton of sodium silicate added.

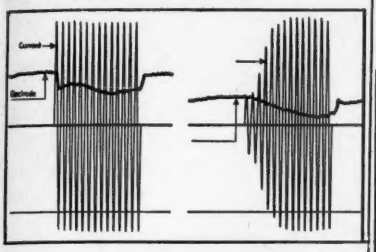
Reynolds
ALUMINUM REPORTER
A SERVICE TO INDUSTRY ON ALUMINUM USES AND DEVELOPMENTS

LOUISVILLE 1, KY. NUMBER 6

NEW MECHANICAL FASTENING METHODS BOOKLET

New Control System Extends Electrode Life 20-30 Times When Spot Welding Aluminum

A new system called "slope control", that extends electrode life 20-30 times when spot welding aluminum with ordinary alternating current welders, has been developed by General Electric and is recommended by Reynolds Metals Company technical staff.



Tip-pressure tracing without (left) and with (right) "slope control"

The new control system restricts the flow of welding current during the first few cycles, allowing the welding current to build up gradually to maximum. This reduces softening of metal under the electrode tip, helps maintain tip pressures, and holds down tip temperatures, thus reducing "sticking" almost to the vanishing point.

In certain oscillograph curves traced during the testing of this system, total amount of heat produced at electrode tips was seen to be something less than one-sixth the usual amount, cutting tip temperature rise tremendously.

For further information on this new system, write for your free copy of the Reynolds Technical Advisor No. 15. Any engineer, designer or executive who requests it on business letterhead will be placed on the mailing list to receive copies of the "Advisor" as issued.

For assistance on any *special* production problem, call on the trained staff of Reynolds Aluminum Specialists ready to help you overcome difficulties and obtain maximum benefits from your aluminum. Call the Reynolds distributor listed under "Aluminum" in your classified telephone directory, or write to Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky

Reynolds Building Largest Gas-Burning Electric Power Plant

To supply the tremendous electric power requirements in its new 80 million dollar aluminum reduction plant at Corpus Christi, Texas, the Reynolds Metals Company is installing 78 internal combustion engines totalling 256,300 horsepower and driving direct-current generators with a total rated output of 176,000 kilowatts. Using natural gas for fuel, it will be the largest gas-burning engine plant so far built anywhere in the world.

Latest Data on Various Types of Mechanical Joints and Fasteners Now Available Upon Request

The Technical Editorial Service of the Reynolds Metals Company has produced a new technical book, "Mechanical Fastening Methods for Aluminum."

As stated in the foreword, "In addition to welding, brazing and soldering, a wide variety of mechanical fastening methods are used to join assemblies involving aluminum parts. This book represents an endeavor to supply the designer and manufacturer with data on the various types of mechanical joints and mechanical fasteners for use with aluminum."

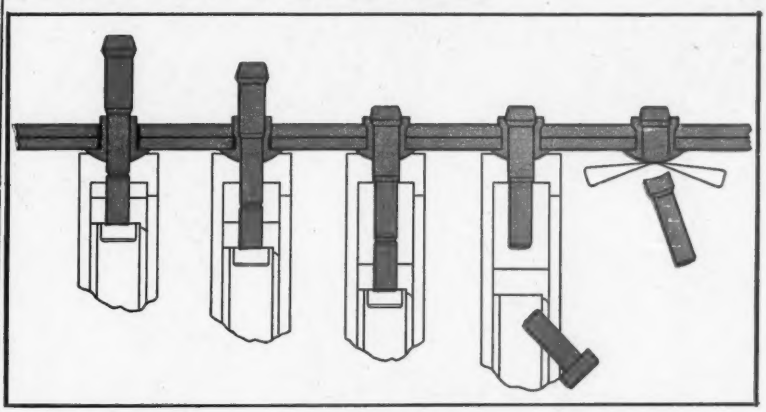


Diagram showing cross-section of method for fastening with self-plugging blind rivets. This is typical of the many explanatory illustrations found in Reynolds newest technical book, "Mechanical Fastening Methods for Aluminum."

Containing all you need to know about fastening aluminum components, this 136-page illustrated booklet is a *must* for your desk reference library. Its handy pocket size makes it ideal for easy carrying and ready accessibility in the shop.

There are tables of related data for the various types of standard rivets, including dimensions and number of pieces per pound, lengths of rivets for cone-point and button-type driven heads, recommended hole sizes with shear and bearing areas for both hot and cold-driven rivets, and maximum loads for single rivet in shear.

You will find in this book answers for your questions on standard and special rivets, standard and special screw fasteners, nails and pins, metal stitching, mechanically formed joints, resin bonding and others.

Illustrated above is an example of one of the complete diagrams explaining the method of riveting, using self-plugging blind rivets.

Application of the latest 1951 fastening methods like these means increased production capacity and lower costs for every type of aluminum assembly.

The Reynolds Metals Company states in the book that they will be glad to grant permission to any technical writers to use transcripts from the book. Also, technical writers and editors may obtain glossy 8 x 10-inch photoprints of any of the book's illustrations.

For manufacturers or designers having a special development problem not covered by this book, Reynolds offers the services of its trained staff of aluminum specialists. Let them show you how to overcome difficulties and set up for fast, economical production. For prompt service, call the Reynolds field office listed under "Aluminum" in your classified telephone directory.

(A reprint of the book's riveting section, the most important mechanical joining method, is available in quantities for distribution to students in schools, colleges and technical groups without charge.)

For your *free* copy of the valuable handbook described above, plus a complete index of Reynolds technical literature, write on business letterhead (otherwise price is $1.00) to Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

MORE INTERESTING NEWS ABOUT ALUMINUM ON NEXT PAGE

...ted in U. S. A.

Aluminum Pipe Makes Portable Sprinkler Irrigation Reality

Use of portable sprinkler irrigation systems on American farms has grown spectacularly since 1945. One of the largest factors causing this increase has been the tremendous advantage of aluminum irrigation pipe.

Extreme portability due to light weight, great strength offering high pressure resistance, plus rust and corrosion resistance . . . all these contributed to the demand for aluminum irrigation pipe and made *portable* sprinkler irrigation a reality.

During the present emergency, aluminum pipe of this type is being used as the basic component of the "Superbazooka", the 3.5 inch rocket-launcher. If you can find a use for extruded aluminum tubing in the design of your future products, call the Reynolds Aluminum Specialist . . . let him work with you to assure the maximum benefits of aluminum. His development and research skill is backed by the experienced staff of the Reynolds Technical Service. For further information call the Reynolds distributor listed under "Aluminum" in your classified telephone directory. Or, write Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

New Idea for Artists' Medium

Swiss experiments indicate that ⅛-inch aluminum, coated with a porous oxide skin, provides a practical and permanent working foundation for oil painting. It doesn't tear, split or wrinkle like canvas and takes less storage space. The smooth surface paints easier, gives more brilliant colors.

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Keeps Moisture Out—Reynolds Plain Aluminum Foil is a positive barrier against transmission of moisture vapor. In gauges .0015" and heavier, it has a zero moisture-vapor-transmission rate.

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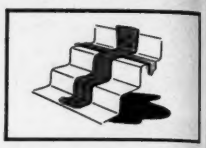
Naturally Greaseproof—Reynolds Plain Aluminum Foil prevents greases on parts from drying out or hardening, thereby losing their value. Aluminum is naturally greaseproof on both sides.

Maintains Top Efficiency Indefinitely—Reynolds Plain Aluminum Foil does not depend on treatments for waterproof qualities, therefore it is not affected by long exposure to dry air or heat.

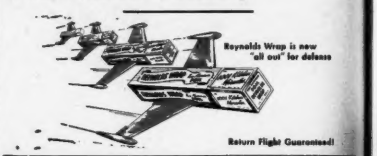
Absolutely Non-Absorptive—Reynolds Aluminum Foil does not absorb dipping compounds as other barrier materials do. This means a direct cash saving on the dipping material used.



No "Spring Back"—Reynolds Plain Aluminum Foil is "dead soft" and holds molded contours. Excellent for parts impractical to package by old-fashioned methods and materials.

Reynolds Pure Aluminum Foil is particularly suited as an intimate wrap for parts which have large air voids and cannot be dipped without undue bubbling. The ease with which it conforms to and holds shape leaves less "dead air space" in package.

For your copy of the FREE booklet "How, Why and When You Should Consider Protective Packaging with Aluminum Foil" write Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.



Aluminum Medical Chest Another Example of Reynolds Parts Fabrication Service

Complete Facilities Help Manufacturers with Military Orders

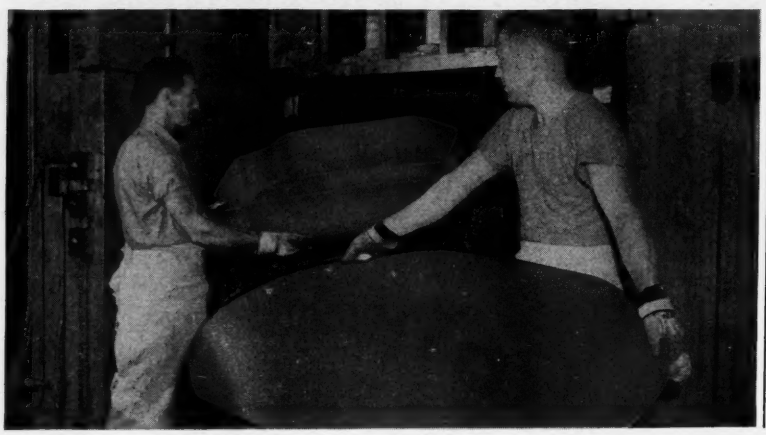
Another example of the complete and valuable service to industry performed by the Reynolds Parts Fabrication Service, these aluminum medical chests are now being produced for the Armed Forces Medical Units. The wide range of facilities available to manufacturers through the use of this service is demonstrated by the blanking, drawing, spot-welding, seam-welding, finishing and other allied operations necessary to produce this type of chest.

Formed of Reynolds .091" Aluminum, these chests have reinforced corners and welded gasket retaining channels for strength and rigidity. Flush mounted hardware allows containers to be stacked on any side. Stacked flat, the nesting feature of the design prevents sliding even when stack is tilted. Gum rubber gaskets assure water-proofing.

Shipping containers like these are only one of the many applications of the skill and production facilities of the Reynolds Parts Fabrication Service. This service provides all manufacturers with extra assembly lines when needed. Through the use of this program, the manufacturer is assured of a steady flow of inspected parts whenever needed and in whatever quantities desired. Quotations on aluminum parts can be furnished to the manufacturers' designs and specifications.

Probably one of the most important features of the Parts Fabrication Service is the tremendous savings in vitally needed scrap . . . averaging 30% and often as high as 75%! This results in savings on shipping, storing and handling charges plus making important scrap readily available for remelting at the mill. On "DO" orders where the allocation is in pounds of metal, the manufacturer gets full value from his allocation, receiving the exact number of parts available from the pounds of metal allocated.

For further information on the Parts Fabricating Service and how it can help your production, merely call the Reynolds office listed under "Aluminum" in your classified telephone directory. Or, write to Reynolds Metals Company, 2065 South Ninth Street, Louisville 1, Kentucky.



New Book Tells Complete Reynolds Aluminum Story

A new booklet has been prepared for distribution to all those interested in modern metal developments. This 45-page booklet, "Reynolds Aluminum and the company that makes it", is the first complete compilation of the facts about the company that did more than any other to bring America's aluminum production up to the point it has reached today. The booklet presents the principal operations of Reynolds Metals Company under "normal conditions" and during the present rearmament program.

Profusely illustrated and handsomely bound, the booklet is available upon request to those writing on business letterhead. Address the Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

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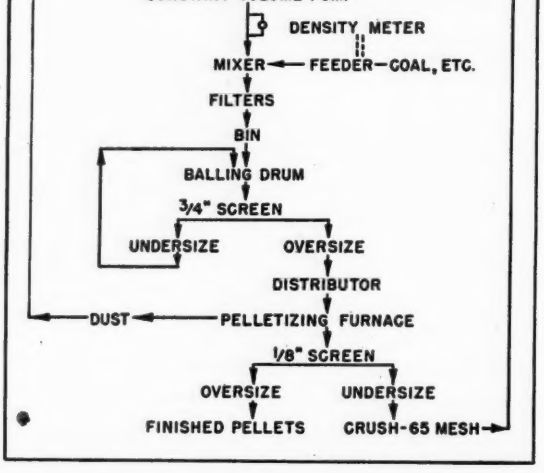
effective in breaking up large masses of pellets so that movement through the seal pipe and discharge feeder is made easier. However, development of methods for discharging large masses of pellets that have become fused together is still a serious problem in larger furnaces and is receiving much attention at the present time.

Three Stock Column Zones—In order to facilitate discussion of the process of pelletizing magnetic taconite, the furnace stock column may be considered as being divided into three zones as shown on p. 84. From the top of the stock down, these are: Drying and preheating zone, firing zone, and cooling zone. It makes little difference whether fuel is added to the ore mix, introduced into combustion chambers, or mixed with the air blown into the bottom of the shaft, the above three zones exist in a properly operating furnace and are similar in nature, extent, and location in the shaft.

Of these three, the cooling zone is, by far, the deepest. This is where the balls, as they move downward, continually get colder and the air, as it moves upward, continually gets warmer. The drying and preheating zone at the top of the column is much shorter than the cooling zone and it is here that the balls get warmer as they move downward and the gases get cooler as they move upward. The firing zone is a comparatively narrow zone between the other two in which both the balls and gases reach maximum temperatures. In this zone, magnetite burns to hematite; the more rapid and complete the burning, the higher the peak temperature that is reached. From this, it is apparent that the preheating zone is the area in which the gases are warmer than the ore. In the cooling zone, the ore is warmer than the gas, and in the firing zone, the ore and gas are at about the same temperature.

The balls are wet when they enter the furnace.



Flow sheet of the pelletizing process

Their water content must be vaporized and carried away with the exit gases; this is the only large, heat-consuming operation in the process. Taconite balls contain about 10 per cent water and the heat required to vaporize this water amounts to about 250,000 Btu per ton of furnace charge, depending somewhat upon temperature of the furnace exit gases. Since the magnetite concentrate, in oxidizing to hematite, liberates in excess of 250,000 Btu per ton, there would be sufficient heat produced by this oxidation to complete the pelletizing operation if there were no heat losses.

Balls Must Be Fed Properly—Next in importance in making good balls is feeding them properly into the pelletizing furnace. If all of the balls were of exactly the same size, and were strong and substantial, and if there were no breakage in handling, feeding would be a comparatively simple operation, but unfortunately, this is seldom the case. Taconite balls made in the ordinary manner will vary in size by as much as a half a diameter; i.e., if the balls are oversize of a one-half inch screen, top size may be about ¾-inch, which is a difference of nearly three and a half times in volume and weight.

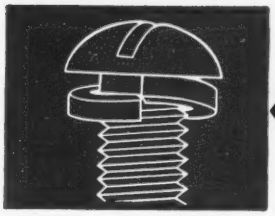
Various feeding methods have been and are still being experimented with, but the most satisfactory method that has been found for our furnace is to move the head pulley of the conveyor from which the balls are fed, around over the top of the charge in a definite pattern. If any low points develop, they are filled up immediately, but balls are not allowed to roll into low spots. This method of feeding has the advantage of distributing the breakage and fines uniformly throughout the furnace.

In general, the rate at which air is blown into the pelletizing furnace determines the rate at which the firing zone moves upward through the charge and this in turn determines furnace capacity per unit of cross-section area. When the furnace is blown at the rate of about 80 to 100 cubic feet of air per minute per square foot of cross-section area, the firing zone moves upward at the rate of one-half to one inch per minute. Under these conditions the furnace has a capacity of from 4 to 5 tons of dry feed per day per square foot of cross-section area.

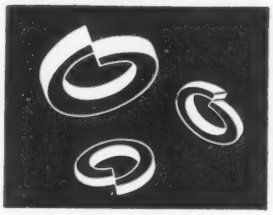
Pellets Have Large Surface Area—Taconite pellets contain about 30 per cent voids and, therefore, present a large surface for fast heat interchange and for rapid reduction. The pellets are high in iron and proportionately low in silica and phosphorus. They contain practically no titanium or sulphur or other objectionable impurities. They weigh about 125 pounds per cubic foot and have an apparent specific gravity of about 3.3. After being submerged in water, they contain about 9 per cent moisture, but after draining for 24 hours, moisture drops to about 5 per cent.

Several testing methods are in use to measure pellet quality but the most satisfying one is a drop test. Our pellets are screened at 14 mesh and a 50-pound sample of the oversize is dropped 3 to 6 times through a distance of 33 feet into a steel box. The product is then screened to determine the effect of this treatment. The best pellets do not produce more

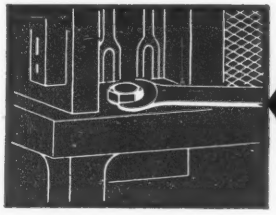
ONE ASSEMBLY UNIT—Spring Lock Washers pre-assembled on bolt or screw eliminate double requisitioning, purchasing, inventory, and stocking red tape, maintain a balanced inventory.



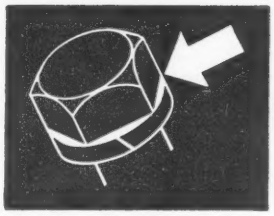
SAFE ASSEMBLY—There is a Spring Lock Washer on every bolted part. Spring Lock Washers can not come off and be swept up with the waste—losses are eliminated.



INCREASED PRODUCTION—Eaton Springtites are easy to use in assembling in hard-to-get-at places, can be hopper fed for automatic screw driving.



CORRECT ENGINEERING—A Standard ASA Spring Lock Washer for each type of bolt or screw prevents criticism and complaints, insures customer acceptability and service of your product. Spring Lock Washer Shank Fit allows freedom of washer movement in application.



CUTS COST—Eaton Springtites save costly employe time by eliminating the necessity for assembling of the Spring Lock Washer on the bolt.

5 ways springtites save

USE THEM, BE CONVINCED

RELIANCE SPRING LOCK WASHERS—for every purpose—automatically keep bolts, nuts, screws tight and under constant tension, compensating for inevitable wear and developed looseness. Write for the Spring Washer Folder

RELIANCE RINGS—snap, bearing, lock retainer rings are used on shafts, in counter bores, and on outer races of bearings. Cut production cost—save time and material. Write for Engineering Folder

Reliance Division

EATON

EATON MANUFACTURING COMPANY

OFFICES AND PLANT **MASSILLON, OHIO**

Sales Offices: New York • Cleveland • Detroit • Chicago • St Louis • San Francisco • Montreal

than 10 per cent of −14 mesh material after three drops.

While the first furnace we developed was of the combusition-chamber type, much more work has been done during the past few years on the internal combustion furnace. While this type appears to be much cheaper to construct and operate than the combustion-chamber type, it has the disadvantage of lacking quick and positive temperature control. This is more apparent than real, however, because of the necessity for making pellets as strong as possible to resist breakage in shipment. This means operating the furnace at or very near the fusion temperature. There is no objection to this if it is equipped to discharge fused pellets; such equipment is now quite generally accepted as being desirable. With a furnace equipped to discharge fused pellets, the necessity for quick and accurate temperature control becomes less important and the internal combustion method in which the supplementary fuel is mixed with the ore before it enters the furnace becomes more interesting. This mixing and proportioning, however, must be carefully planned.

Little Variance in Carbon Content — When it is considered that 28 pounds of coal must be mixed so thoroughly with 2240 pounds of ore that each of the 75 thousand balls made from it will contain one-sixth of a gram of carbon, this blending operation looks difficult. However, it has not been found to be difficult, since the mixing may be done in the slurry form before the ore is filtered. Many tests have been made in which 25 balls have been selected at random from the furnace feed belt and each ball analyzed for carbon. Typical results show the average of all 25 balls to be 1.12 per cent carbon, with the highest analysis being 1.20 per cent and the lowest 1.09 per cent. Maintaining the desired proportion is more difficult than mixing because of changing rates of pulp flow and of per cent solids in the pulp. This has been well worked out, however, by pumping a constant volume of the pulp to the mixer and then controlling the coal fed to it by the density of the pulp.

Actually, when making hard pellets, maintaining the carbon content of the balls within 10 per cent of the desired analysis is all that is required. Thorough mixing of the coal is more important than having exactly the right amount but maintaining uniform porosity in the stock column is most important of all.

Pelletizing Requirements Listed— The most important requirements for pelletizing using the internal combustion furnace are: Mix coal thoroughly, make good, clean balls, feed them to the furnace in such a manner that there is absolutely no segregation, and equip the bottom of the furnace with adequate clinker breakers. This furnace can be used to pelletize all types of iron ore except those in which ball shrinkage in the preheating zone is so great as to make them impervious to furnace gases. No such ore has been tested but this effect has been observed when too much sodium silicate has been added to the balling mixture.

In pelletizing with the combustion-chamber type furnace, the most important requirements are: Make good, clean balls, feed them to the furnace in such a manner that there is absolutely no segregation, design the furnace so that there are no restrictions that will impede the downward movement of the charge, even if it is clinkered solid, and equip the bottom of the furnace with adequate clinker breakers. This furnace can be used to pelletize all types of iron ore provided that the combustion chambers are designed to operate with exit gas temperatures as high as 2400° F. If the balls contain sufficient combustible materials such as magnetite, the combustion chamber temperature can be reduced to 1850° F but the higher temperature is required for pelletizing hematite.

A combination-type furnace equipped to operate simultaneously with combustion chambers and fuel additives is now receiving very careful attention. The main idea is that this type may develop some special advantage that will, to some extent, obviate the necessity for maintaining uniform porosity in the stock column and, at the same time, make carbon control less sensitive. This furnace can be used to pelletize any type of iron ore. However, if the balls, for any reason, are impervious to the furnace gases, the combustion chambers would have to operate at a very high temperature.

Valve Catalog Revised

Logansport Machine Co., Logansport, Ind., announces revisions in its air control valve catalog 100-4. These revisions effect only those pages covering light-duty 2-position 4-way valves, 2 and 3-way valves and poppet-type hand control valves.

The revised pages provide engineering data, information, illustrations and dimensional drawing on additional valve models plus changes in model numbers. This literature is now available on request.

CALENDAR OF MEETINGS

† *Denotes first listing in this column.*

August 20-23, American Institue of Electrical Engineers: Pacific general meeting, Multnomah Hotel, Portland, Oreg. Institute address: 33 W. 39th St., New York 18.

August 20-23, National Association of Power Engineers Inc.: Annual meeting and exhibit, Hotel Plaza, San Antonio, Tex. Association address: 176 W. Adams St., Chicago 3.

September 3-7, American Chemical Society: Annual meeting, Hotel Statler, Washington. Society address: 1155 16th St. NW, Washington 6.

September 4-6, Liquefied Petroleum Gas Association: Pacific Coast convention, Fairmont Hotel, San Francisco. Association address: 11 S. La Salle St., Chicago 3.

September 5-7, American Hot Dip Galvanizers Association Inc.: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 2311 First National Bank Bldg., Pittsburgh.

September 6-7, Rail Steel Bar Association: Semi-annual meeting, The Broadmoor, Colorado Springs, Colo. Association address: 38 S. Dearborn St., Chicago.

September 8-9, New York; September 14-15, Washington, International Union of Pure and Applied Chemistry: Annual meeting.

September 10-13, International Congress of Pure and Applied Chemistry: Annual meeting, New York.

September 10-14, International Foundry Congress: Brussels. Congress address: General secretary, Foundry Congress, c/o Fabrimetal, 17 Drapiers St., Brussels.

September 10-14, Instrument Society of America: National instrument conference & exhibit, Sam Houston Coliseum, Houston. Society address: 921 Ridge St., Pittsburgh 12.

September 10-15, Annual Industrial Engineering Conference: Mechanical Dept., Industrial Engineering Division, Michigan State College, E. Lansing, Mich.

September 11-13, Society of Automotive Engineers: Tractor meeting, Hotel Schroeder, Milwaukee. Society address: 29 W. 39th St., New York.

September 14-16, American Society of Sanitary Engineering: National convention, Hotel Statler, Detroit. Society address: 1308 Freemont St., McKeesport, Pa.

September 17-19, Allied Railway Supply Association: Fall meeting and exhibit, Hotel Sherman, Chicago. Association address: Box 5522, Chicago 80.

September 21-23, National Association of Waste Material Dealers Inc.: Fall meeting, Saranac Inn, Upper Saranac Lake, N. Y. Association address: 1109 Times Bldg., New York 18.

September 24-25, Steel Founders Society of America: Fall meeting, The Homestead, Hot Springs, Va. Society address: 920 Midland Bldg., Cleveland 20.

September 24-25, American Coke & Coal Chemicals Association: Annual meeting, Skytop Lodge, Skytop, Pa. Institute address: 711 14th St. NW, Washington.

September 24-26, National Truck Body Mfrs. & Distributors Association: Annual convention and suppliers exhibit, Haddon Hall, Atlantic City, N. J. Association address: 346 Connecticut Ave. NW, Washington.

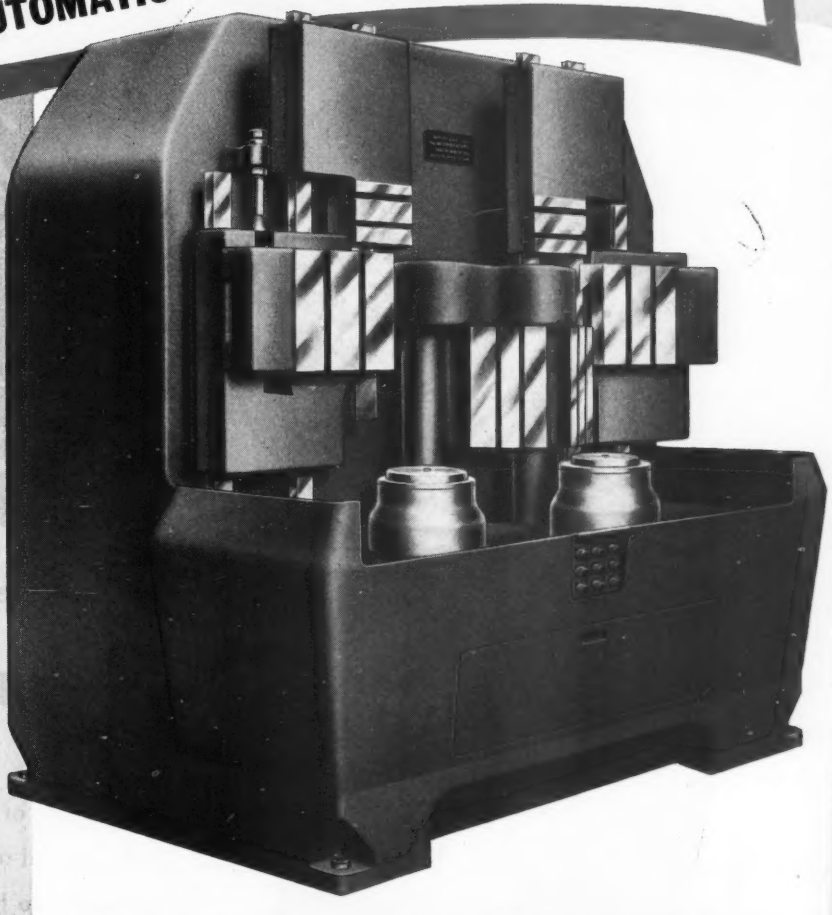
September 25-28, American Society of Mechanical Engineers: Fall meeting, Hotel Radisson, Minneapolis. Society address: 29 W. 39th St., New York.

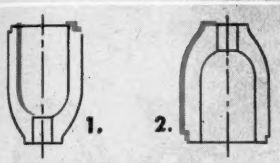
†**September 26-29, Marking Device Association:** National convention, Edgewater Beach Hotel, Chicago. Association address: 134 N. La Salle St., Chicago.

NOW- the HYDRA-TURN

MULTI-SLIDE AUTOMATIC • Single or Double Spindle Operation

for *High Production*
TURNING, BORING and FACING





2-SPINDLE MACHINE

No. 1 — on one spindle
No. 2 — on other spindle

PART—3" dia. shell

— No. 1 —

Operation — Contour bore I. D.
Turn step on O. D.
Face open end

Estimated production — 137 per hr. @ 100%

— No. 2 —

Operation — Contour turn O. D.
Face other end

Estimated production — 137 per hr. @ 100%

2-SPINDLE MACHINE

Same operation on both spindles

PART—13" dia. flywheel

Operation — Bore, counterbore and chamfer

Estimated production — 68 per hr. @ 100%

You can simplify operations and get more out of your machine hours by using the Motch & Merryweather heavy duty *Hydra-Turn* for precision turning, boring and facing on single or double spindle applications. It excels for chucking operations or work on center. You profit from fast loading, tool accessibility, easy chip disposal and less operator fatigue. Production is multiplied with fewer machines, saving floor space.

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Builders of Circular Sawing Equipment, Production Milling, Automatic and Special Machines

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT

Iron and Steel *need protection too!*

If it's made of iron or steel,
and exposed to the elements,
remember to have it
Hot-Dip Galvanized—*sealed in zinc!*

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Galvanizing Company

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The World's Largest Job Galvanizing Plant

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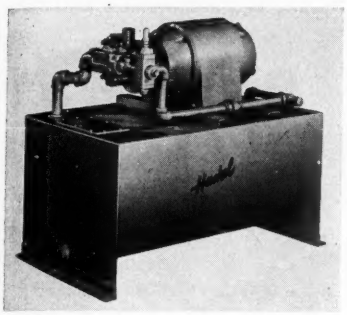
in the heart of the STEEL INDUSTRY

galvanizing . . . . pickling . . . . painting . . . . oiling

New Products and Equipment

Hydraulic Power Units

Hydraulic power units, combining reservoir, pump and motor into a compact package is announced by Haskel Engineering & Supply Co., 721 W. Broadway, Glendale 4, Calif. The line contains 224 standard models in three basic standard series: 1. Low-pressure units which supply up to 1750 psi pressure and range from 1½ to 50 gallons per minute in single pump models or to 100 gpm in double pump models; 2. high-low units that provide a dual pressure source by combining a high pressure and low pressure pump with automatic unloading of the low pressure pump; 3. high-pressure units, supplying to



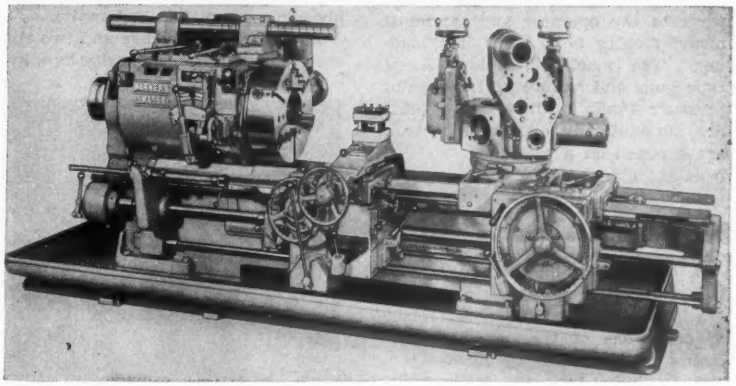
10,000 psi pressure and ranging from 1½ to 5 gpm in single pump models and to 10 gpm in double pump models.

Low-pressure and high-low units feature cylindrical reservoir bottoms for maximum usage of oil, visible oil level indicator plugs and adjustable pressure relief valves. The power units are available for either stationary installation or for use as a portable unit with two swivel and two fixed heavy duty synthetic rubber tread casters and provisions for towing.

Check No. 1 on Reply Card for more Details

Turret Lathes Redesigned

Hydraulically actuated forward and reverse clutch in combination with a disk-type hydraulic brake has been incorporated in the headstock of the model 4A heavy duty saddle type turret lathe made by Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, O., providing for faster and smoother handling of the 8 to 12-inch bars accommodated. Mechanism is controlled by a forward-reverse-brake lever which eliminates the neutral or intermediate delay position. The rapid traverse shaft has been moved to the front, and rapid traverse is provided to the cross slide with a single lever to control rapid traverse motion in four directions.



Power for the rapid traverse drive is supplied by a separate 3 hp motor mounted in back of the headstock. This motor also drives the coolant, hydraulic and lubricating pumps. Pressure in the lubricating system is increased, and a pressure gear pump is applied to the unit. All electrical controls are consolidated in a single box, simplifying protection and maintenance. Bar feed attachment for the 4A model is hydraulically operated. The power chuck wrench control lever is replaced by a pistol grip arrangement, using a trigger interlock release for easier manipulation.

Check No. 2 on Reply Card for more Details

Load Centered Automatically

Hydraulically operated clamp for industrial fork trucks, which enables bales, bins, drums, and miscellaneous

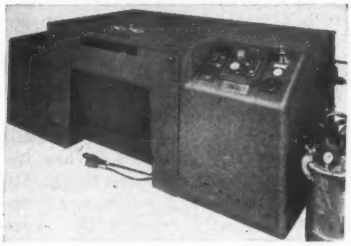
containers to be picked and transported on the centerline of the truck is a development of Philadelphia Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. This clamp eliminates instability caused by off-center loading, particularly when clamp and load are rotated.

When used with a rotator, the clamp does not creep off center. Loss of pressure grip in arms is minimized. A variable clamping pressure permits handling of any type load, from fragile cartons to heavy containers. Arms have an inside opening range from 17 to 66 inches. Clamp will handle loads up to 6000 pounds, and can be installed on gasoline or electric trucks.

Check No. 3 on Reply Card for more Details

Production Spray Painter

An automatic air-operated spray painting machine with hydraulic control that permits the painting of a



variety of small parts on a mass production basis, is a development of Conforming Matrix Corp., 345 Toledo Factories Bldg., Toledo, O. Parts can be wet painted, one color right after another. Spraying is from underneath against the masks minimizing cleaning. Surplus spray falls away, is sucked off and exhausted out of the back of the machine. Electro-formed metal masks fit flush with the table and parts are loaded manually by the operator. The spraying is automatic but the length of spray time and the speed of the loading

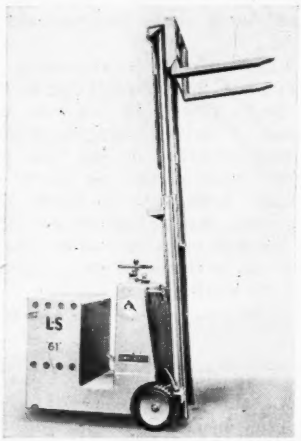
cycle are controlled by dials upon the control panel. Production rates up to 3600 pieces per hour are possible.

A conveyor belt, which can flow across the rear of the table, brings work to the operator and carries it away, freeing both hands for loading. The machine employs latest type guns and has air agitated paint pressure tanks. All working parts are automatically oiled and controls are grouped on a panel.

Check No. 4 on Reply Card for more Details

Works in Small Areas

A heavy duty high speed electric fork truck designed for warehouse operations where minimum operating space is one of the prime requirements is announced by Lewis-Shepard Products Inc., 195 Walnut St., Watertown 72, Mass. Spacemaster 61



will carry and high stack loads up to 3000 pounds and 48 inches long. It is also capable of picking up and transporting loads up to 4000 pounds and 32 inches long. Pallets 40 inches long can be right angle stacked in a 10-foot aisle.

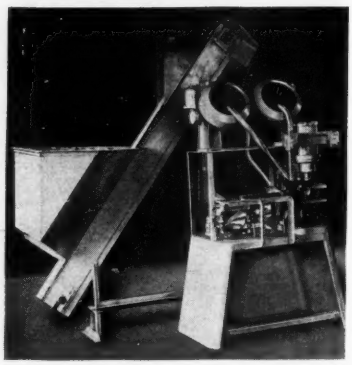
Mast design provides 127 inches of fork elevation and 65¼ inches free lift with 83-inch collapsed height. Hydraulic pump and pump motor are located directly beneath the operator's corridor and can be easily reached for service work. All vital parts can be inspected or serviced from top side of truck. Design of the truck eliminates the need for periodic lubrication.

Check No. 5 on Reply Card for more Details

Clutch Plate Assembler

Klass Machine & Mfg. Co., 4328 E. 49th St., Cleveland 25, O., has designed a machine to place springs in clutch plate cavities. Separate hoppers contain the rivets which hold the spring in the cavity and the springs themselves. Two rivets are automatically fed to the spring where one rivet is placed in each end of the spring. The spring is dropped from a separate hopper to make the assembly cycle completely automatic.

The assembled springs and two rivets are forced into the cavity by a hy-

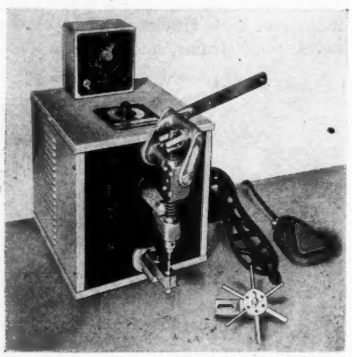


draulic press. An air-operated indexing fixture rotates the clutch plate each time a cavity is filled with the spring-rivet assembly. The machine can be adapted to assembly of any size clutch plate with varying requirements as to the number of spring assemblies needed. Conveyors can be supplied to carry the parts from the bins to the separate hoppers and also to keep the hoppers filled automatically.

Check No. 6 on Reply Card for more Details

Machine Welds and Solders

Joyal Products Inc., 56 Belmont Ave., Newark, N. J., announces a resistance spot welding and soldering machine equipped with timer. It silver solders, soft solders and spot welds precious and dissimilar metals;



spot welds steel parts up to 3/32-inch thick; solders brass up to ⅛-inch thick as well as sterling silver and other precious metals. Collars determine control pressure to protect parts soldered from excessive heat that would cause marking.

Model 1000 WV operates on 110 v ac at 9 amps and model 2000 WV operates at 220 v ac at 10 amps. The latter model is equipped with water-cooled electrode holders. The electrode operation is spring-action controlled so that, when electrode arms are closed, work is held firmly in position during soldering and cooling. An automatic cutoff timer regulates soldering time and heat control with 11 adjustments determines correct heat for the job. When dials are set uniform soldering time, heat and holding pressure on the electrodes are maintained, regardless of how long the foot switch is held down.

Check No. 7 on Reply Card for more Details

Multiple Spindle Drill

Toolkraft Corp., Springfield, Mass., announces a line of heavy duty, production model, industrial multiple spindle drill presses. Standard 15-inch models are available with one to

six heads mounted on large table with cast iron legs.

Features included in the Darra-James drill presses are: Self-aligning grease sealed ball bearings, double hinged guard, lifts from front to rear, free floating six spline spindle and streamlined design.

Check No. 8 on Reply Card for more Details

Faster Metal Disintegrators

Electronic control without tubes and faster cutting speeds are features of the metal disintegrators made by Electro Arc Mfg. Co., 5930 Commonwealth Ave., Detroit, Mich. Electrical current to operating head is rectified to direct current and head is so constructed that contact is made 60 times a second at alternating current peak of positive half of sine wave. Since maximum burning power can only be obtained at this peak, high cutting efficiency is assured.

"One always stands out"

and among refractory dolomites it's . . .

BAKER'S MAGDOLITE

ALWAYS 5 WAYS BETTER

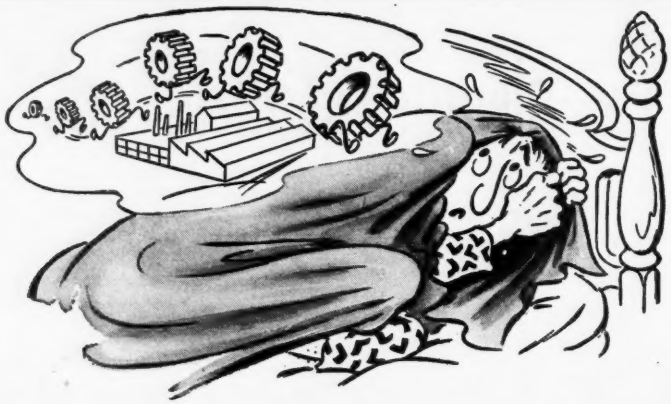
- **Composition**
- **Preparation**
- **Economy**
- **Strength**
- **Quality**

In these days of highly competitive, 100% of capacity production, it pays to use "both hands." And it pays to use **Baker's Magdolite**, the absolutely dependable refractory dolomite.

Magdolite's superior chemical, physical, and mineralogical composition assure you of minimum maintenance and repairs. When you buy . . . specify **Baker's Magdolite** . . . the logical choice in refractory dolomites.

JEBCO PRODUCTS
MAKERS OF BAKER'S MAGDOLITE

THE J. E. BAKER COMPANY
YORK, PENNSYLVANIA • Plants: Billmeyer, Pennsylvania • Millersville, Ohio



Why lose sleep counting scrap?

If you're worrying about profits (and how to produce them) you're also probably worrying about scrap (and how to eliminate it). Federal Gages *can* improve the control of dimensions throughout your manufacturing processes — the sure way to reduce scrap, waste, and rework . . . the sure way to increase profits.

How do we know it's the sure way?

Because we've been building Gages for over 20 years. Because we've helped every type of manufacturing industry . . . and seen our Gages improve quality, reduce scrap, and increase output. Because we have over 20,000 individual gage designs in our engineering files — each representing an actual case where Federal Gages have been put to work PROFITABLY. Because we offer you the choice of the right gaging system (mechanical, air, electronic, electrical) correctly designed (on the basis of actual experience) to do your job in the best possible way (manually, semi-automatically, fully automatically).

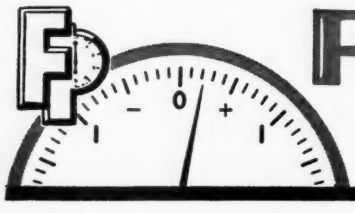
Don't lose sleep over scrap. Put your dimensional control problems up to Federal. It's the wise thing to do. FEDERAL PRODUCTS CORPORATION, 1217 Eddy St., Providence 1, Rhode Island.

FEDERAL DIMENSIONAL CONTROL IS ALWAYS IN THE PICTURE

Continuous Measuring Gage checks thickness of hard board sheets . . . automatically marks defective areas.

Federal Dimensionair Air Gage (range .003", magnification 2500 to 1) used in combination with Dial Indicator.

Electronic Gage automatically sorts mica sheets into correct thickness categories.

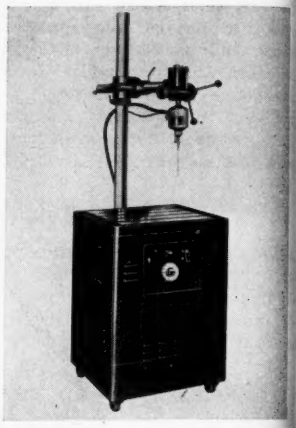


FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing all types of DIMENSIONAL INDICATING GAGES.

Solenoid actuates spindle downward assuring steady contact with me at all times and regardless of positi of operating head.

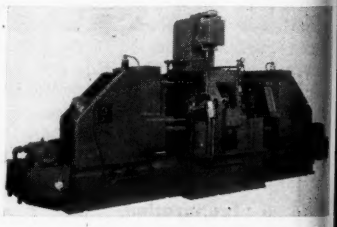
Average cutting speeds claimed by the company are: Disintegrate a ¼-inch drill, 2 inches deep in 1½ minutes; disintegrate a 27/64-inch reamer, 1¼ to 1½ inches deep in 2 minutes; cut 3/16-inch hole through 3/32-inch deep hardened steel (62 Rockwell) in 10 seconds; disintegrate ¼-20 tap to depth of ⅞ to 1 inch in 1 minute; and disintegrate ½-13 tap to depth of 1⅝ inches in 4 2/3 minutes.



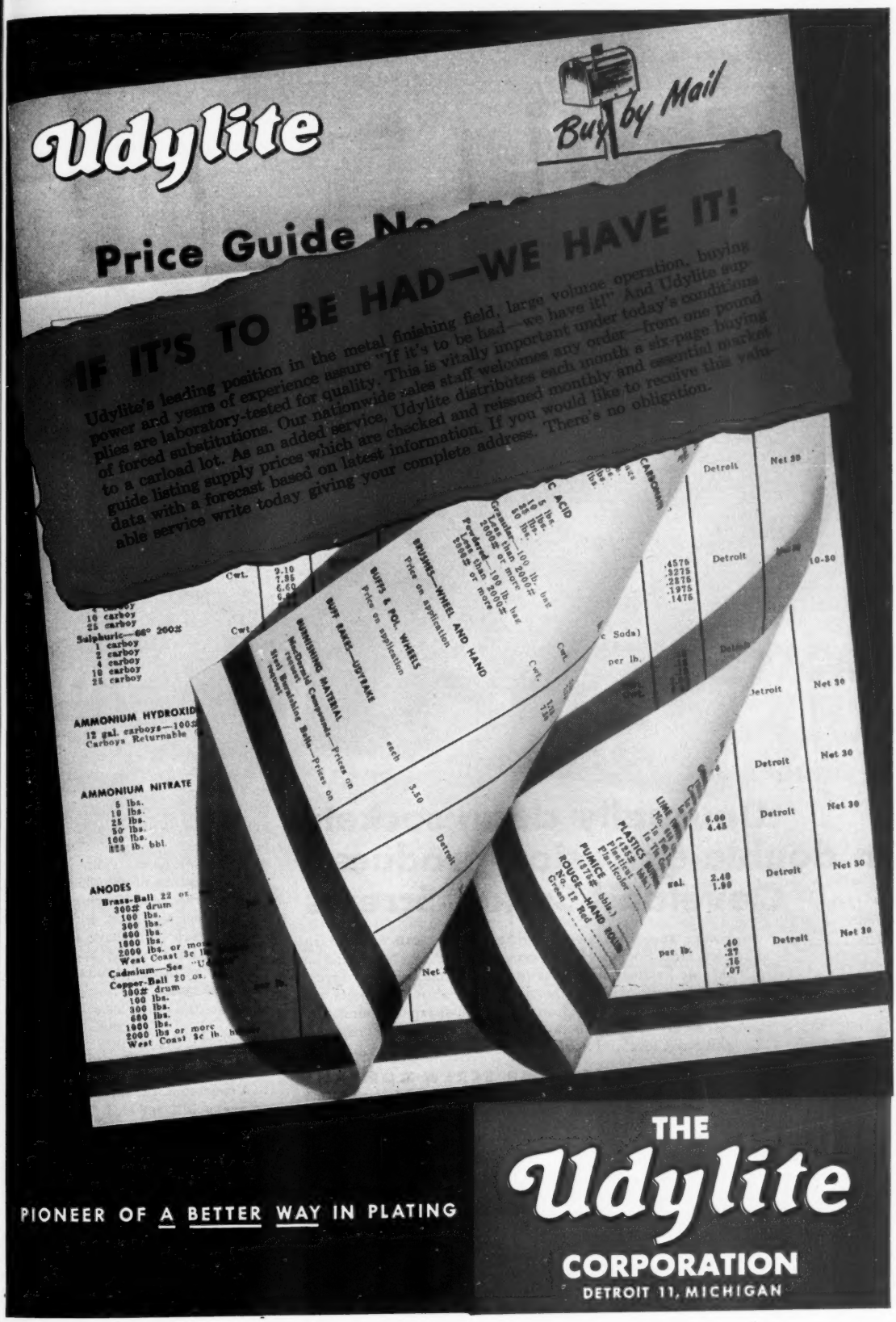
Check No. 9 on Reply Card for more Details

Multiple Drilling Jobs Handled

A three-way 20-spindle hydraulic speed drilling machine has been built by Le Maire Tool & Mfg. Co., 2657 S. Telegraph Rd., Dearborn, Mich. It consists of a fabricated steel center base which carries trunnion support with No. 200 twin ram vertical single spindle units with No. 30 HS horizontal right hand and left hand units. The right hand unit has a nine spindle head and the left hand unit has a ten spindle head.



The No. 30 HS units have hardened and ground steel ways with a distance of 30 inches across the ways. The ten-position trunnion is hydraulically operated for automatic indexing and carries ten work holding fix-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PIONEER OF A BETTER WAY IN PLATING
THE Udylite CORPORATION
DETROIT 11, MICHIGAN

Unusually clean sockets in double-extrusion-produced Cleveland Socket Screws

You're sure of faster-working, extra clean sockets in Cleveland Socket Head Screws. Made by the Kaufman Double Extrusion Process in closely controlled progressive operations *in one machine,* (see above) sockets are perfectly concentric, true hex with sharp corners, and *clean*—all the way to the bottom. It pays you to specify and buy Cleveland Socket Head Screws.

THE CLEVELAND CAP SCREW COMPANY
2917 East 79th Street • Cleveland 4, Ohio
Warehouses: **Chicago, Philadelphia, New York, Providence**

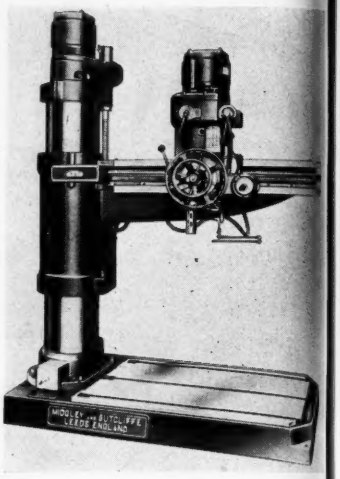
CLEVELAND *Top Quality* FASTENERS

tures which are clamped in a cla with a hydraulic torque wrench. Pr duction is approximately 100 pie per hour at 100 per cent efficiency.

Check No. 10 on Reply Card for more De

Precision Radial Drilling

Richmond HB3 radial drilling ma chine, made in England by Midgley & Sutcliffe, is available through Britis Industries Corp., International Ma chinery Div., 164 Duane St., Ne York 13, N. Y. Fatigue and idle tim



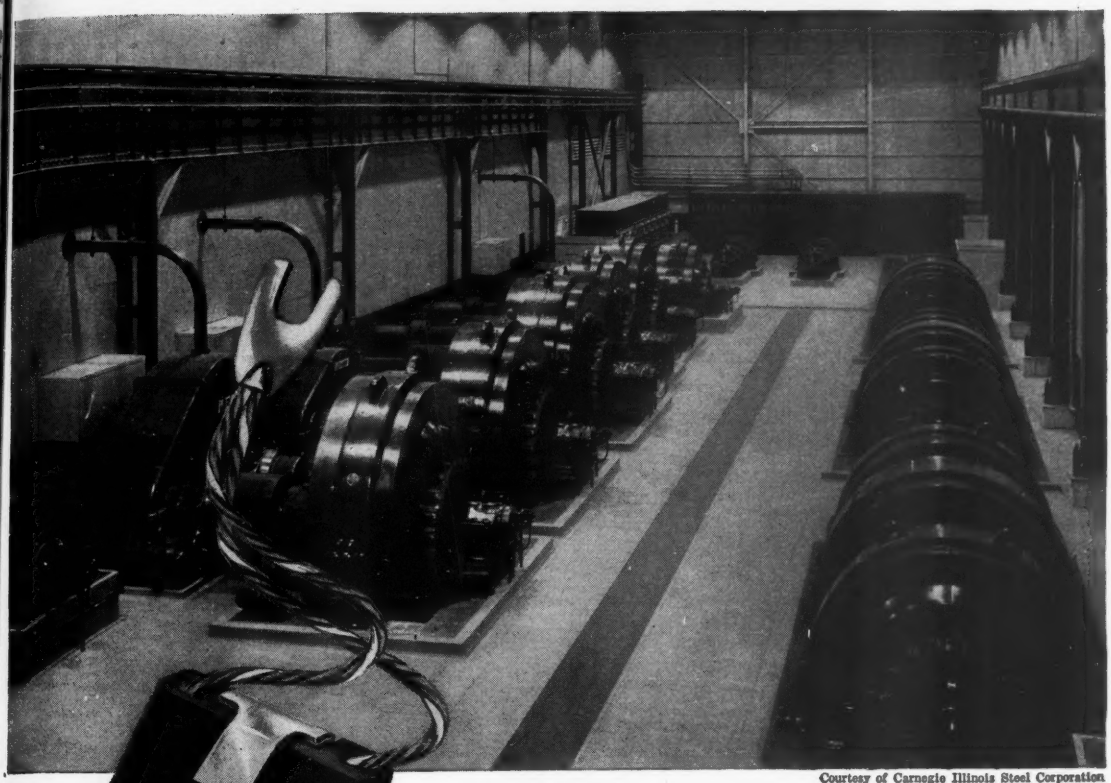
are reduced to a minimum by centralized levers. Separate motors provide drilling and elevating power, both motors being controlled by a single joy-stick type switch on saddle. Driving gears are made from chrome nickel steel and shafts are high carbon heat treated steel running in ball bearings. Sliding gears are mounted on six spline shafts.

A wide range of spindle speeds provides for tapping, boring and drilling in steel or alloys. Lubrication of saddle gears is positive and dependable by built-in pump. Electrical supply meets NEMA standards, 220 v 3 phase 60 cycle.

Check No. 11 on Reply Card for more Detail

Foil and Screen Repair

A portable resistance spot welder is available from H. I. Thompson Co. 1733 Cordova St., Los Angeles 7, Calif., for on-the-job repair of Inconel and stainless steel foil and screen and for making alterations required by changes in design. Operation of the Hit-Kit is by trigger-type switch. Foil is securely welded in place by contacting both electrodes to the foil surface and inducing current by operating the trigger. Welder is equipped with leads 9 feet in



Courtesy of Carnegie Illinois Steel Corporation

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The NATIONAL standardized brush for main-drive motors

THABE-MARK

Main-drive motors and generators are the most important machines in the mill. If one of them fails, production stops dead. Tons of steel may be held up. It doesn't pay to take chances with the brushes on this vital equipment.

Here's why "National" SA-Series grades lead the field on main-drive equipment:

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- Minimum commutator wear
- Long life
- Low flat price, for one box or 10,000 boxes
- Unequalled uniformity

STANDARDIZED BRUSHES FOR MAIN-DRIVE MOTORS AND GENERATORS

NC NUMBER	SPECIFICATIONS	APPLICATIONS
NC 12-5610	2½ x 1¾ x ⅜ Grade SA-35*	For Westinghouse Tandem Holders
NC 16-5603	2½ x 1¾ x ½ Grade SA-35	For Westinghouse Tandem Holders
NC 12-4802	2¼ x 1½ x ⅜ Grade SA-35	For "Toe-to-Toe" Holders
NC 16-4804	2¼ x 1½ x ½ Grade SA-35	For "Toe-to-Toe" Holders

Order by NC Number

FOR COMPLETE INFORMATION on National Carbon's brush standardization program and the advantages it offers, write to National Carbon Company, A Division of Union Carbide and Carbon Corporation, Dept. IS.

The term "National" and the Three Pyramids Device are registered trade-marks of Union Carbide and Carbon Corporation

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A Division of Union Carbide and Carbon Corporation

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District Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

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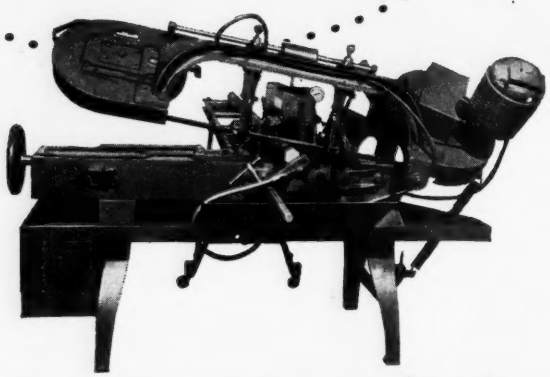
Get the advantages of AUTOMATIC BAR STOCK CUT-OFF at a fraction of the cost you might expect



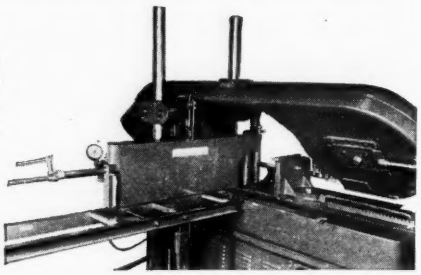
. . . . . with a WELLS SAW and WELLS-O-BAR Feed Master

A set-up for automatic repetitive cutting need not be prohibitively expensive. By combining a Wells Metal Cutting Band Saw and a Wells-O-Bar Feed Master you can automatically cut any quantity of identical lengths of bar stock with a modest investment. Or, a Wells-O-Bar Feed Master can be added to your present horizontal band saw to convert it to an automatic cut-off machine.

For operation the feed unit requires only air at 60 to 80 pounds pressure. Standard feed will project up to 17". The feed mechanism does not interfere with the use of the saw for making single cuts.

See your Wells Dealer for complete information or write direct.

The illustration above shows the Wells-O-Bar unit attached to a Wells No. 8 Saw. At the right is the unit attached to a Wells No. 12 Heavy Duty Machine.



Wells Saws

Wells

The Pioneers of Horizontal

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
1515 FILLMORE ST., THREE RIVERS, MICHIGAN

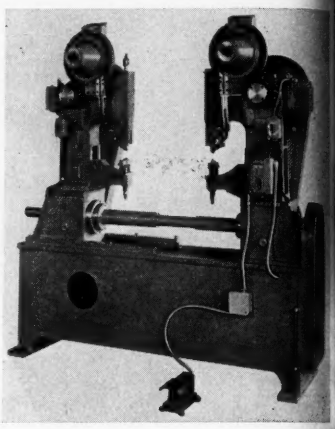
length attached to welding tips and operates on 110 v ac. Standard model includes tools and materials necessary for many types of repair.

Foil thicknesses up to 0.004 and screen wire diameters up to 0.0[illegible] can be spot welded. Complete outfit is contained in a portable carrying case which consists of a sheet steel box with lift-out tray and is equipped with a luggage-type carrying handle. Box measures 8 x 10 x 20 inches, weighing 35 pounds, with welder and tools.

Check No. 12 on Reply Card for more Details

Two Rivets Set at a Time

A dual Rivitor that saves time and labor in assembly and riveting has been designed by Tomkins-Johnson Co., Jackson, Mich. It is equipped with 10-inch hoppers and tooled to automatically feed and set two ⅝-



inch diameter by ⅝-inch long wagon box heads rivets at a time.

Machine consists of two 8-inch model R Rivitors, mounted face to face on a common base and adjustable for rivet spacings ranging from 2½ inches to 18 inches center to center. One motor drives both flywheels, which are synchronized by a combination gear and chain drive arrangement. Both clutches are tripped by solenoids, connected to a single foot switch.

Check No. 13 on Reply Card for more Details

High Capacity Humidifier

Model 300-B heavy-duty high capacity humidifier being produced by Daffin Mfg. Co., Lancaster, Pa., uses a high pressure pump which breaks up water through specially developed nozzles. Although the unit dispenses a high degree of humidification over a large area, it covers a floor area of 22 x 26 inches and is 42 inches high. Atomization capacity is in-

SCRAP

can swing the balance

on the scales that weigh our worthiness to continue free. *So keep the scrap moving,* back to the mills. *Get it back to work,* as fast as you can. This is no time for idleness either of men or metals. And here at Bristol, we hope to keep just as busy as this, shoveling in the scrap that goes to produce more and more Bristol Brass sheet, rod and wire. The Bristol Brass Corporation, since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means Brass at its Best

creased one-third over the older model. Water passes into the air stream by a method of compartment separation and syphoning at a discharge rate of about 1200 cubic feet of air per minute.

Humidifier is fully adjustable with moisture output adjusted to fit individual requirements. Power is supplied by a ½-hp electric motor and only a cold water supply and a 110 volt ac power source are required in most installations. A water drain is unnecessary because tank capacity is controlled by a float; pumping only the water to be used for air humidification.

Check No. 14 on Reply Card for more Details

Air Flow Switch

An improved vane-type pressure air flow switch for use in forced air cooling of electronic equipment is introduced by Coral Designs, division of Henry G. Dietz Co., Long Island City 2, N. Y. It is designed to operate a control relay to guard against tube failure in event of blower failure or air-passage obstruction.

Check No. 15 on Reply Card for more Details

Gas Burning Nozzles

The new gas burning nozzles available from Hauck Mfg. Co., Brooklyn 15, N. Y., combine a flame retaining nozzle and a long sweep elbow into a single unit. It produces a long cylindrical, torch type blast flame. The unit is recommended for firing kilns, heat treating and melting furnaces, ovens, air heaters, boilers, immersion tubes and for ladle heating or drying.

Check No. 16 on Reply Card for more Details

Strap Cutting Tool

E14AO strap cutter, introduced by Acme Steel Co., Chicago 8, Ill., is designed to cut flat steel strapping up to ¾ x 0.035-inch. A band guide prevents straps from wedging sidewise between the blades. A flat lower blade permits easy insertion beneath tensioned straps on bales, bundles and cartons.

Check No. 17 on Reply Card for more Details

Cutter Grinder Microscope

For checking radii, forms and angles of engraving tools, small twist drills and similar tools and components that carry an irregular shape at the end of a cylindrical shank, the P. G. cutter grinder microscope made by George H. Alexander Machinery Ltd., Birmingham, England, is offered by J. Arthur Deakin & Son, Jamaica 2, N. Y. It consists of a 15X magnifying microscope with detachable reticle. An adjustable microscope tube is mounted on a vertical slide for focusing workpiece.

Check No. 18 on Reply Card for more Details

Automatic Illumination Control

Model 1089 plug-in automatic illumination control, offered by Weston Electrical Instrument Corp., Newark 5, N. J., provides completely automatic on-off control of artificial lighting at predetermined light levels. It may be plugged into a standard watt-hour meter receptacle.

Check No. 19 on Reply Card for more Details

Valve Features Babbitt Seat

Heavy duty valve No. 788, made by R-S Products Corp., Philadelphia 44, Pa., is equipped with totally enclosed gear reduction drive, extended shaft and floor stand. Sealing of water pressure is obtained by utilizing a babbitted seat in the body and Monel or stainless steel welded to the periphery of the valve disk.

Check No. 20 on Reply Card for more Details

Lightweight Dust Hood

A new lightweight dust hood is offered by Willson Products Inc., Reading, Pa., for use in atmospheres containing heavy concentrations of irritating dust. It can be used with or without a respirator by use of easily interchangeable frames and windows.

Check No. 21 on Reply Card for more Details

Direct Flow Pump

Aldrich Pump Co., Allentown, Pa., offers a 6-inch stroke direct flow pump series. It includes Triplex, Quintuplex, Septuplex and Nonuplex units having 3, 5, 7 and 9 plungers, respectively. Ranging from 300 to 900 hp, the new series covers applications such as heavy forging press service, steel mill descaling, etc. Pumps feature inverted design and direct flow fluid-end.

Check No. 22 on Reply Card for more Details

Molded Packings

Periflex Inc., Hazel Park, Mich., announces a line of molded packings for hydraulic and pneumatic equipment. They are compression molded from special fabric and neoprene compound that is resistant to a wide variety of hydraulic fluids.

Check No. 23 on Reply Card for more Details

Winding Temperature Equipment

A new line of winding temperature equipment for power transformers is announced by Transformer and Allied Product Divisions, General Electric Co., Schenectady 5, N. Y. It consists of a Hotspot indicator-relay, Hotspot indicator for local indication and a Hotspot indicator for remote indication. All the new equipment can be removed and tested without de-energizing the transformer, lowering the oil level or in any way interfering with operation of the transformer.

Check No. 24 on Reply Card for more Details

Prime Coat for Metal

Rustygon, developed by Genaco Chemical Division, General Steel Warehouse Co. Inc., Chicago 39, Ill. is a prime coat for metal surfaces that dissolves and prevents rust. No oil is used in its manufacture and its coefficient of expansion and contraction being similar to metal permits it to move with the metal and avoids cracking and blistering. It can be applied with a rag, brush, spray or by dipping.

Check No. 25 on Reply Card for more Details

Indicates High Temperatures

Tempil Corp., New York 11, N. Y., has developed Tempilaq to indicate 2000° F. It can be obtained in 12 or 13-degree steps from 113 to 400° F and in 50-degree steps from 400 to 2000° F.

Check No. 26 on Reply Card for more Details

Synthetic Rubber Sealer

Minnesota Mining & Mfg. Co., Detroit 2, Mich., introduces EC-1055, a resilient sealing compound in extruded form which when pressed into a seam and tightened between metal surfaces, seals the joint like a rubber gasket. When heated, it swells about 50 per cent and cures to a tough flexible mass providing a sponge-rubber type of seal.

Check No. 27 on Reply Card for more Details

Monitors Speeds of Many Units

Speeds of many machines can be measured from one convenient location with the new tachometer that employs a machine selector knob. Developed by Metron Instrument Co., Denver 9, Colo., it is offered in a wide selection of over 50 standard full scale range markings.

Check No. 28 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Helpful Literature

74. Brazing Applications

Handy & Harman—4-page illustrated "Low Temperature Brazing News" No. 54 shows applications of preformed shape low temperature Easy-Flo and Sil-Fos silver brazing alloys. Case histories cover variety of parts, production of which has been speeded and simplified through use of these alloys.

75. Rubber-Pad Forming

R. W. Bliss Co.—4-page illustrated bulletin No. 39 "Presses for Rubber-Pad Forming" relates how airframe manufacturers use this technique to produce short-run, wrinkle-free, deep and complex stampings in standard hydraulic press. Die diagrams show use of rubber pads in single and double-action presses.

76. Phosphatizing Process

American Chemical Paint Co.—2-page technical data sheet No. 7-2-5 summarizes the advantages of applying Lithoform to galvanized metals before painting. Chemical is a non-inflammable, liquid zinc phosphate for preventing peeling of paint on galvanized iron, zinc or cadmium surfaces. Brush, spray and dip processes are explained.

77. Ventilators & Louvers

Burt Mfg. Co.—Design and construction features for each ventilator type, plus mounting and flashing details are found in illustrated and condensed catalog. Performance, dimension and weight data is included, along with basic information on dampers, bases, industrial and general purpose louvers.

78. Tool & Die Miller

Cincinnati Milling Machine Co.—20-page illustrated catalog No. M-1731 describes 8 x 18-in. tool and die milling machine for all types of work, especially those jobs requiring accurate duplication of shaped contours or intricate detail. Machine will produce forging, die casting and embossing dies; plastic molds; master hobs and glass molds.

79. Solder

American Smelting & Refining Co., Federated Metals Div.—36-page illustrated catalog supplies educational material on nature, properties and uses of solder. Sections are devoted to thermal effects, mechanical properties, fluxes, principles of soldering and other detailed subjects.

80. Automatic Dispatch Systems

American Monorail Co.—12-page bulletin AD-1 pictures and describes use of MonoTractor propulsion and MonoRail track equipment for plant materials handling. Drawings show set up of machinery for dispatch and delivery between two or multiple stations, selective dispatch between multiple stations and load and delivery between two or more stations.

81. Electric Hoists

Clyde Iron Works, Inc.—12-page illustrated bulletin K-3A details line of electric hoists made in sizes and styles to fit most hoisting requirements. Included are one, two and three-drum contractor's hoists and high speed, low speed compound-geared, shaft and mine hoists, plus custom built models.

82. Drilling Machine

Elox Corp. of Michigan—Illustrated data sheet describes model M6 Electron drill used for production drilling of large and small holes in hardened metals and production removal of broken taps, drills and reamers without annealing or hardening of work piece. Hole dimensions can be held to plus or minus 0.005-in.

83. Welding Alloys

Eutectic Welding Alloys Corp.—Almost 100 different low temperature welding alloys used in welding, brazing and hard surfacing various metals have their specifications listed in 6-page folder 246P which opens up into 11 x 25-in. wall chart. General welding information is also presented.

84. Measuring Bath Heat

Leeds & Northrup Co.—8-page illustrated bulletin N-33-640(1) is entitled "Measure Bath Temperatures Effectively with Immersion Thermocouple or Rayotube." Shop conditions which govern selection of either of these means for measuring temperatures of molten metals are outlined. Equipment is listed for either assembly.

85. Dynamometer

General Electric Co.—4-page publication GEA-6552 describes and illustrates type TLC cradled 250-v, direct current dynamometers for direct connection testing of internal combustion engines, electric motors, pumps, blowers and compressors. Controls and accessories are listed.

86. Stamping Techniques

Leake Stamping Co.—"How Modern Stamping Techniques Can Help Conversion" is title of illustrated brochure, reprint of paper presented by James M. Leake, company president, at Pressed Metal Institute meeting. How company and industry can help in defense program is outlined.

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HELPFUL LITERATURE

87. Motor Control

Allen-Bradley Co.—92-page illustrated "Handy Catalog" gives data on complete line of motor controls of both alternating and direct current type. Included is condensed information, dimensions, prices and other data to aid in selection and application of proper control for any given condition.

88. Quarter-Turn Valves

Homestead Valve Mfg. Co.—16-page illustrated reference book No. 39, section 3, shows operating principle and contains application data on quarter-turn, Lever-Seald valves which are available in up to 12-in. size in two, three and four-way types and for pressures up to 1500 psi. Constructions are available to meet any service conditions.

89. Pillow Blocks

W. A. Jones Foundry & Machine Co.—Catalog No. 88 gives pointers on construction, application and installation of Timken-equipped pillow blocks ranging in sizes to take shaft diameters of 1 15/16 to 9 in. Engineering data, bearing capacities, lubrication information, dimension drawings, types and sizes are presented.

90. Flaw Detection

Magnaflux Corp. — "Maintaining Quality Standards in Industry" is 8-page illustrated bulletin which explains how Magnaflux system for testing and inspecting magnetic metal parts reduces costs. Typical applications, principle of operation and available equipment are described.

91. Hydraulic Pulling Tool

Owatonna Tool Co.—Details of Power-Twin hydraulic puller for installing and removing cylinder sleeves, shafts, gears and wheels as well as many other operations are presented in 8-page illustrated bulletin 97-A. This 10-lb tool has capacity of 17½ tons and is adaptable for pushing, pulling or lifting operations.

92. Barrel Finishing

Minnesota Mining & Mfg. Co.—Faster production and better finishes produced by barrel finishing of metal parts is described in 12-page illustrated booklet "3M Barrel Finishing." New applications are given for Honite and Super Honite abrasive chips which are designed for deburring, surface finishing and precision finishing of machined parts, stampings, forgings, castings and other metal parts.

93. Heat Treating Equipment

Diamond Iron Works, Inc.—4-page illustrated bulletin NX-1 catalogs line of heat treating equipment including heaters, torches, forges, tool furnaces, blowers and valves. List of 22 products mentions specific bulletins that are also available upon request.

94. Piston Grinder

Landis Tool Co.—Specifications on the new type H 5 x 8-in. precision piston grinder are listed in 4-page illustrated bulletin CH-51. Machine will grind cam-shaped pistons on production basis, and adjustment is provided for varying the amount of eccentricity of the piston.

95. Heat Treating Furnaces

Hevi Duty Electric Co.—8-page bulletin IND-451 illustrates and describes use and construction of Hevi Duty pit type convection furnaces. Installation photos show several industrial applications. Tabulated specifications are also included.

96. Bar & Tube Turners

Medart Co.—16-page illustrated bulletin No. RT 49 is entitled "Medart Centerless Turners for Round Bars and Tubes". Information is given on design, operation and uses of continuous automatic turning and peeling machines for production operations on round bars, tubes and billets. Also described are bar pointers, feeding and delivery tables, and straightening and polishing machines.

97. Precision Balls

Industrial Tectonics Inc. — 2-page bulletin 511 lists sizes and properties of precision balls from 1/32 to 4-in. diameter or larger. Balls can be supplied in various materials including sintered carbides, synthetic sapphire, Stellite, titanium, plastics, ceramics, stainless, high speed steel and chrome steel.

98. Hydraulic Power Units

Haskel Engineering & Supply Co. —12-page illustrated bulletin No. 210 details performance, application information and recommendations for selection and installation of 311 standard and custom-built hydraulic power units and bell-mounted motor-pump units. Data on extra equipment available is included.

99. Air Line Fittings

Wilkerson, Inc.—Three data sheets present photos, descriptions and prices of air line governor, automatic air tank drain valve and automatic air line drain valve.

100. Ball Bearings

General Motors Corp., New Departure Div.—16-page pocket-size booklet "Making Them Round" presents the story of how steel balls for ball bearings are manufactured. Photos illustrate various steps in grinding, lapping and polishing through which balls pass, as well as pressure tests and final use in finished bearings.

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You Can Tighten Your Grip on Production with This Method

These giant jaws, made from Vega (Air-Tough) Tool Steel, grip 13½" round steel billets during rough turning in the largest machine of its type. Steady, uninterrupted production in the operation depended largely on quickly finding the right tool steel.

The company had been using an oil-hardening steel for jaws in normal-sized machines. But when the new giant came along it was a different story. Now a steel was needed that would harden uniformly, and *through very heavy sections*. By using the Carpenter Matched Set Method, the company was right the first time in selecting Vega . . . and saved costly experimenting with different tool steels. More important, production management was able to put the jaws in operation, knowing they could depend upon heavy production schedules being maintained.

This workable Method offers your plant more advantages than accurate, simplified tool steel selection. It can help you make machine operators more productive. It can do a lot to make heat treating a "routine", trouble-free procedure. It can hold your tool steel inventories to a minimum. Find out how, why and where it can work for you. Write for the new booklet "How to Get Better Tool and Die Performance". THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

Export Department: The Carpenter Steel Co., Reading, Pa.—"CARSTEELCO"

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More than top-grade steels . . . a Method to keep tooling and production on schedule!

For your convenience, Carpenter carries warehouse stocks in principal cities throughout the country

The Market Outlook

STEEL distribution under the Controlled Materials Plan, started only this month, already is in difficulty. Tonnage certified for September shipment far exceeds the limits of mill set-asides set up by the National Production Authority for military and essential consumption. As a result, steelmakers have turned away authorizations right and left. The ensuing flood of complaints to Washington from consumers over the country last week prompted NPA to up mill set-asides on various products, hoping through such action to avert threatened serious production interruptions at plants unable to get their steel authorization honored by the mills. Also, NPA may seek to stretch September supplies for rated orders by an across-the-board slash in CMP allotments for the month, direct military tonnage excepted.

OFF-TRACK—Somewhere along the line CMP planning appears to have misfired. Government controllers at the moment don't know why more tonnage has been authorized than the mills can accommodate. CMP was designed to effect desired balance between production and consumption, tonnage allotments being co-ordinated with available supply. Just why things have gone haywire so soon has the government planners mystified. At any rate, they are moving quickly to get CMP squarely on the track in time to avert a fourth quarter collapse. Meanwhile, confusion is mounting in steel mill order departments as harassed clerks seek to process stacks of certified paper piling up on their desks.

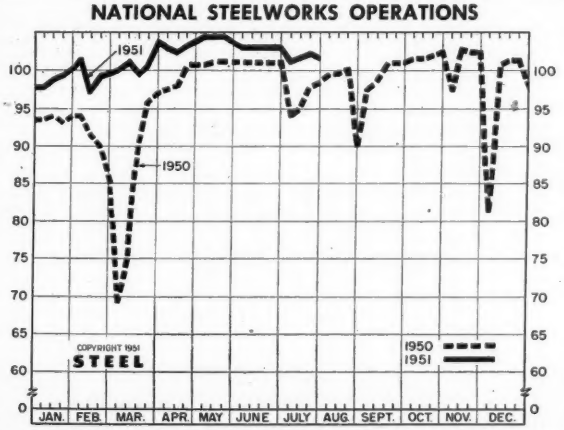
FOURTH QUARTER—Requests for fourth quarter tonnage are coming to the mills in mounting volume. Some producers of certain products already appear to be fully covered for the period. For instance, one large mill is out of the market on sheared plate. Certain other platemakers are in almost as tight a position. Various hot-rolled bar makers have no tonnage left on small sizes for the quarter. Delivery promises on shapes, hot-rolled sheets and galvanized sheets are far extended.

ALLOCATIONS—Rush of consumers to file their fourth quarter steel tonnage applications with the government is on at the moment. Producers of class B products have until July 31 to get their requests in. The same is true of manufacturers of consumers durable goods who are expected to be brought under the CMP umbrella by the time fourth quarter rolls around. Time will be required to process all these requests, naturally adding to the delay and confusion in rounding out the supply picture for the closing months of the year. Last week NPA added certain stainless steel and alloy steel products to the list of carbon steels that producers must reserve to meet the needs of warehouses and converters.

PRODUCTION—Steelmaking operations eased off slightly last week, the estimated national ingot rate slipping ½ point to 101.5 per cent of capacity. This is equivalent to production of about 2,028,000 net tons. Indications are production will be pushed to the limit of available facilities right through remainder of the year, though some equipment will have to go down from time to time for necessary repairs. Expectations are that with new facilities coming into production over the closing months of the year, finished steel output in October-November-December will be substantially greater than in the current quarter, possibly by as much as 500,000 tons.

PRICES—With the exception of the lifting of ceiling prices on products containing tungsten, including tool steels, all steel and related prices are unchanged. High speed and tool steels containing tungsten were increased in line with ceiling price supplementary regulation No. 42 permitting increases of 1.5 cents per pound for each percentage point of tungsten over 1 per cent. This results in price increases of 27 cents per pound on standard tungsten-type high-speed steel, and 9.5 cents per pound on molybdenum type averaging 6.75 per cent tungsten. STEEL's weighted index on finished steel holds unchanged at 171.92.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended July 28	Change	Same Week 1950	Same Week 1949
Pittsburgh	96	— 2*	101	77
Chicago	105.5	+ 0.5*	102	87.5
Mid-Atlantic	101	+ 0	97.5	81
Youngstown	105	+ 2	107	72
Wheeling	94.5	+ 2.5	98.5	92
Cleveland	98.5	0	94.5	93.5
Buffalo	104	0	104	96
Birmingham	100	0	100	100
New England	94	+19	92	12
Cincinnati	101	— 2	106	91
St. Louis	97	0	86.5	75.5
Detroit	101.5	+ 1*	107	106
Western	105	+ 3	98	76
Estimated national rate	101.5	0	98.5	81

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 27 Production-Engineering News—p. 63

Composite Market Averages

	July 26 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)..	171.92	171.92	171.92	156.69	112.04
Index in cents per lb.	4.657	4.657	4.657	4.245	3.035
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32	$94.36	$64.45
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	46.85	28.17
Basic Pig Iron, GT	52.16	52.16	52.16	45.97	27.50
Malleable Pig Iron, GT ...	53.27	53.27	53.27	47.49	28.79
Steelmaking Scrap, GT ...	44.00	44.00	44.00	37.33	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	July 26 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.20	4.20	4.20	3.93	2.86
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.10–15	3.10
Shapes, Std., Pittsburgh ..	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia ..	3.91	3.91	3.91	3.46	2.48
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa. ...	4.15	4.15	4.15	3.60	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.60	2.50
Sheets, H.R., Pittsburgh ..	3.60–75	3.60–75	3.60–75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh ..	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh..	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh ...	3.75-4.00	3.75-4.00	3.75-4.00	3.25–50	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh ...	4.65-5.35	4.65-5.35	4.65-5.35	4.15–50	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.35-5.60	4.35-5.60	4.35-5.60	4.35–95	3.15
Wire, Basic, Pittsburgh ...	4.85-5.10	4.85-5.10	4.85-5.10	4.50	3.05
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.30	3.75
Tin plate, box, Pittsburgh.	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$", Pitts. ..	4.10–30	4.10–30	4.10–30	3.85	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$47–$50	$29.00
Basic Valley	52.00	52.00	52.00	46.00	28.00
Basic, del. Phila.	56.49	56.49	56.49	49.44	29.93
No. 2 Fdry. Pitts.	52.50	53.50	52.50	49.50	28.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry, Valley	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry, Del. Phila. ...	56.99	56.99	56.99	49.94	30.43
No. 2 Fdry, Birm.	48.88	48.88	48.88	42.38	24.88
No. 2 Fdry (Birm.)del. Cin.	56.33	55.33	55.33	49.08	28.94
Malleable Valley	52.50	52.50	52.50	46.50	28.50
Malleable, Chicago	52.50	52.50	52.50	46.50	28.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts. ..	$45.00	$45.00	$45.00	$41.00	$20.00
No. 1 Heavy Melt. E. Pa. .	43.50	43.50	43.50	33.00	18.75
No. 1 Heavy Melt. Chicago.	43.50	43.50	43.50	38.00	18.75
No. 1 Heavy Melt. Valley .	45.00	45.00	45.00	40.75	20.00
No. 1 Heavy Melt. Cleve. .	44.00	44.00	44.00	38.50	19.50
No. 1 Heavy Melt. Buffalo.	44.00	44.00	44.00	36.75	19.25
Rails, Rerolling, Chicago ..	52.50	52.50	52.50	48.50	22.25
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	44.50	20.00

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connlsvl. ..	$14.75	$14.75	$14.75	$14.25	$8.75
Beehive, Fdry., Connlsvl. ..	17.50	17.50	17.50	15.50	9.50
Oven Fdry., Chicago	21.00	21.00	21.00	21.00	14.35

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	22.50	14.375
Zinc, E. St. Louis	17.50	17.50	17.50	15.00	9.50
Lead, St. Louis	16.80	16.80	16.80	11.80	9.35
Tin, New York 106.00	106.00	106.00	97.75	52.00	
Aluminum, del.	19.00	19.00	19.00	17.50	15.00
Antimony, Laredo, Tex. ..	42.00	42.00	42.00	24.50	14.50
Nickel, refinery, duty paid.	56.50	56.50	56.50	48.00	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn,N.Y.,del.	....	58.69	59.46	....
Newark,del.	56.74	57.24	57.74	58.24
Philadelphia,del.	56.49	56.99	57.49	57.99
Birmingham District				
AlabamaCity,Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward,Ala. W15	48.38	48.88	....	....
Cincinnati,del.	....	55.33	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda,N.Y. W12	52.00	52.50	53.00	....
No.Tonawanda,N.Y. T9	....	52.50	53.00	....
Boston, del.	61.63	62.13	62.63	....
Rochester,N.Y., del.	54.74	55.24	55.74	....
Syracuse,N.Y.,del.	55.72	56.22	56.72	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary,Ind. U5	52.00	....	52.50	....
IndianaHarbor,Ind. I-2	52.00	....	52.50	....
So.Chicago,Ill. W14	52.00	52.50	52.50	....
So.Chicago,Ill. Y1	52.00	52.50	52.50	....
So.Chicago,Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	53.97	54.47	54.47	54.97
Muskegon,Mich.,del.	....	58.20	58.20	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, del. from Cleve.	54.49	54.99	54.99	55.49
Lorain,O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie,Pa. I-3	52.00	52.50	52.50	53.00
Everett,Mass. E1	....	55.25	55.75	....
Fontana,Calif. K1	58.00	58.50	....	....
Geneva,Utah G1	52.00	52.50	....	....
Seattle,Tacoma,Wash.,del.	....	60.35	....	....
Portland,Oreg.,del.	....	60.35	....	....
LosAngeles,SanFrancisco,del.	59.85	60.35	....	....
GraniteCity,Ill. G4	53.90	54.40	54.90	....
St.Louis,del. (inc. tax)	54.66	55.16	55.66	....
Ironton,Utah C11	52.00	52.50	....	....
LoneStar,Tex. L6	48.00	*48.50	48.50	....
Minnequa,Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	52.50	52.50	53.00
Pitts.,N.&S. sides, Ambridge, Aliquippa,del.	....	53.74	53.74	54.24
McKeesRocks, del.	....	53.49	53.49	53.99
Lawrenceville, Homestead, McKeesport,Monaca,del.	....	54.00	54.00	54.50
Verona,del.	....	54.48	54.48	54.98
Brackenridge,del.	....	54.72	54.72	55.22
Bessemer,Pa. U5	52.00	....	52.50	53.00
Clairton,Rankin,So.Duquesne,Pa. U5	52.00	....	....	....
McKeesport,Pa. N3	52.00	....	....	53.00
Monessen,Pa. P7	54.00	....	....	....
Sharpsville,Pa. S6	....	....	52.50	53.00
Steelton,Pa. B2	54.00	54.50	55.00	55.50
Swedeland,Pa. A3	56.00	56.50	57.00	57.50
Toledo,O. I-3	52.00	52.50	52.50	53.00
Cincinnati,del.	57.21	57.71	....	....
Troy,N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard,O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield,O.,del.	56.43	56.93	56.93	57.43

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson,O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls,N.Y. P15	$88.00
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 x 6)

Lyles,Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton,Pa. B2	60.00
Philadelphia delivered	63.13
Troy,N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, July 26, 1951 cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 .....53.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 .....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 .....56.00
Fontana,Calif. K1 .....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 .....56.00
Lackawanna,N.Y. B2..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 .....56.00
So.Duquesne,Pa. U5 ...56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 .....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 .....66.00
Fontana,Calif. K1 .....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah G1 .....66.00
Houston,Tex. S5 .....74.00
Johnstown,Pa. B2 .....66.00
Lackawanna,N.Y. B2 ..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14 .66.00
So.Duquesne,Pa. U5 ...66.00
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O. (29) T7 ....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston,Tex. S5 .....78.00
Ind.Harbor,Ind. Y1 ...70.00
Johnstown,Pa. B2 .....70.00
Lackawanna,N.Y. B2 ..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14 .70.00
So.Duquesne,Pa. U5 ...70.00
Struthers, O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ...103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ...82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ....3.35

WIRE RODS
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 .....4.90
Houston,Tex. S5 .....4.50
Johnstown,Pa. B2 .....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y.B11 4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.30
Roebling, N. J. R5 ....4.20
So.Chicago,Ill. R2 .....4.10
SparrowsPoint,Md. B2 ..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester A7 .....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ..4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 .....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 .....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah G1 .....3.65
Houston,Tex. S5 .....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ....4.95
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5, W14..3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago, Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah G1 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y1 .....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala., T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah G1 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 ..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Harrisburg,Pa. C5 ....5.95
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ...3.95
Ashland,lcl(15) A10 ....4.45
Cleveland,c.l. R2 .....4.30
Warren,O.c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky.(15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 ....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 ....4.15
Conshohocken,Pa. A3..4.15
Fairfield, Ala. T2 .....3.70
Fontana,Calif.(30) K1..4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 ....4.40
Geneva,Utah G1 .....3.70
Harrisburg,Pa. C5 .....4.95
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5, W14..3.70
SparrowsPoint,Md. B2 ..3.70
Steubenville,O. W10 ....3.70
Warren,O.R2 .....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5, Y1..3.70

PLATES, Carbon A. R.
Fontana,Calif. K1 .....5.45
Geneva,Utah G1 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill.(1) L1 .....3.95
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11..3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2, U5, W14..3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ...4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 .....3.85
Youngstown R2, U5 .....3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif., P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R. CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston,Tex. S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity, Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2,U5,W14..4.30
S.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna, N. Y. B2..5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....4.55
BeaverFalls,Pa. M12,R2..4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ....4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13..4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 ....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 ....5.10
Readville,Mass. C14 ....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa.(5) K3...5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 .....4.55

BARS, Cold-Finished Alloy
Ambridge, Pa. W18 ....5.40
BeaverFalls,Pa. M12 ....5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.50
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13..5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ..5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 ....5.60
So.Chicago,Ill. R2, W14..5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ...4.50
Franklin,Pa.(3,4) F5...4.75
FortWorth,Tex.(26) T4..4.85
Huntngtn,W.Va.(3) W7.5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda (3,4) B12 ..4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 ..12.25
Economy,Pa.(S.R.) B14..9.60
Economy,Pa.(D.R.)B14 11.90
Economy,(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ....9.60
McKRks.(D.R.) L5....13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Alton,Ill.(6) L1 .....3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3 .....4.60
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 .....3.60
WestLeechburg,Pa. A4..3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R., (19 gage)
AlabamaCity,Ala. R2 ...4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R. (14-ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ..5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
IndianaHarbor,Ind. Y1..5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 .....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.55
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1..7.05
IndianaHarbor,Ind. I-2..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

ROOFING SHORT TERNES (8 lb. coated)

Gary,Ind. U5	9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky. (8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary, U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo C16	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2..	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary U5	8.45	8.70
Ind.Har. I-2, Y1.	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren R2	8.45	8.70
Weirton W6	8.45	8.70
Yorkville,O. W10.	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1.	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled Alloy

Bridgprt,Conn.(10) S15.	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15.	5.45
Sharon,Pa. S8	5.85
Youngstown U5	5.50

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1.	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3.	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill.(1) L1	3.75
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15.	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1.	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11.	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2.	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4.	3.75
Youngstown U5, Y1	3.50

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8: Cleve.-or-Pitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

STRIP, Hot-Rolled Carbon

NewBritn,Conn.(10) S15	10.75
Pawtucket,R.I.(11) N8	10.70
Pawtucket,R.I.(12) N8	11.00
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgprt,Conn.(10) S15.	5.35
Butler,Pa. A10	4.60
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.25
Fontana,Calif. K1	6.20
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.50
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8.	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div.
Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

SHP, Hot-Rolled Ingot Iron

Ashland,Ky. (8) A10 ...3.75
Warren,O. R2 .....4.10

SHP, Cold-Rolled Ingot Iron

Warren,O. R2 .....5.25

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.05
Riverdale,Ill. A1 .....3.90
Sharon,Pa. S3 .....4.15
Youngstown U5 .....3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2 .	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19) K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville MS	5.95	6.40
Donora,Pa. A7 ..	5.70	6.15
Duluth,Minn. A7 .	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5..	6.10	6.55
Johnstown B2 ...	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5.	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3 ..	6.65	...
Minnequa C10 ...	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts,Calif. C11..	6.65	6.80
Prismth.(18)P12 .	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2 ..	5.70	5.95
So.S.Fran. C10 ..	6.65	7.10
SparrowsPt. B2..	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1 .	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1) K4.	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsville MS..	10.30	12.00
Fostoria,O. S1 ...	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10 ...	10.40	12.40
Palmer,Mass. W12	10.25	12.15
Pitts.Cal. C11 ...	10.60	12.50
Prismth.(18) P12.	10.55	12.30
SparrowsPt. B2..	10.35	12.25
Waukegan A7	10.25	12.15

ROPE WIRE	(A)	(B)
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1 ..	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7 .	8.80	9.05
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5.	8.85	9.10
SparrowsPt. B2 ..	8.65	8.90
Struthers,O. Y1 ..	8.55	8.80
Worcester J4, T6.	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ...4.85
Aliquippa,Pa. J5 .....4.85
Atlanta A11 .....5.10
Alton,Ill.(1) L1 .....4.85
Bartonville,Ill.(1) K4 ...4.85
Buffalo W12 .....4.85
Chicago W13 .....5.10
Cleveland A7, C20 ....4.85
Crawfordsville,Ind. M8..5.10
Donora,Pa. A7 .....4.85
Duluth,Pa. A7 .....4.85
Fairfield,Ala. T2 .....4.85
Fostoria,O.(24) S1 ....5.35
Houston S5 .....5.25
Johnstown,Pa. B2 .....4.85
Joliet,Ill. A7 .....4.85
KansasCity,Mo. S5 ....5.45
Kokomo,Ind. C16 .....4.95
LosAngeles B3 .....5.80
Minnequa,Colo. C10 ...5.10
Monessen,Pa. P7 .....5.10
Newark, 6-8 ga. I-1 ....5.50
No.Tonawanda B11 ....4.85
Palmer,Mass. W12 .....5.15
Pittsburg,Calif. C11 ....5.80
Portsmouth,O. P12 .....5.25
Rankin,Pa. A7 .....4.85
So.Chicago,Ill. R2 .....4.85
So.SanFrancisco C10 ....5.80
SparrowsPoint,Md. B2 ..4.95
Sterling,Ill.(1) N15 ....4.85
Struthers,O. Y1 .....4.85
Torrance,Calif. C11 ....5.80
Waukegan,Ill. A7 .....4.85
Worcester,Mass. A7, T6. .5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 .....6.20
Buffalo W12 .....6.35
Cleveland A7 .....5.85
Crawfordsville,Ind. M8..6.20
Detroit D2 .....6.20
Dover,O. G6 .....6.20
Fostoria,O. S1 .....6.00
Kokomo,Ind. C16 .....5.70
FranklinPark,Ill. T6 ...6.20
Massillon,O. R8 .....5.85
Monessen,Pa. P16 .....5.85
Monessen,Pa. P7 .....6.10
NewHaven,Conn. D2 ...6.50
Pawtucket,R.I.(12) N8..6.85
Trenton,N.J. R5 .....6.15
Worcester A7 .....6.15
Worcester T6 .....6.50
Worcester W12 .....6.65

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1) K4 ..8.90
Buffalo W12 .....8.90
Chicago W13 .....8.90
Cleveland A7 .....8.90
Crawfordsville,Ind. M8..8.95
Fostoria,O. S1 .....8.90
Johnstown,Pa. B2 .....8.90
Kokomo,Ind. C16 .....8.90
Monessen,Pa. P16 .....8.90
Palmer,Mass. W12 .....9.20
Portsmouth,O. P12 .....8.90
Roebling,N.J. R5 .....9.20
Waukegan, Ill. A7 .....8.90
Worcester,Mass. A7, T6.9.20

WIRE, Galv'd ACSR For Cores

Bartonville,Ill. K4 .....8.50
Monessen,Pa. P16 .....8.50
Roebling,N.J. R5 .....8.80
SparrowsPoint,Md. B2 ..8.60
Johnstown,Pa. B2 .....8.50

WIRE, Tire Bead

Bartonville,Ill.(1) K4 ..10.90
Monessen,Pa. P16 .....11.40
Roebling,N.J. R5 .....11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....6.25
Alton,Ill.(1) L1 .....6.25
Bartonville,Ill.(1) K4 ..6.25
Buffalo W12 .....6.25
Cleveland A7 .....6.25
Donora,Pa. A7 .....6.25
Duluth A7 .....6.25
Fostoria,O. S1 .....6.25
Johnstown,Pa. B2 .....6.25
LosAngeles B3 .....7.20
Milbury,Mass.(12) N6 ..8.05
Monessen,Pa. P7, P16..6.25
Palmer,Mass. W12 .....6.55
Pittsburg,Calif. C11 ....7.20
Roebling,N.J. R5 .....6.55
Portsmouth,O. P12 .....6.25
So.Chicago,Ill. R2 .....6.25
So.SanFrancisco C10 ...7.20
SparrowsPoint,Md. B2 ..6.35
Struthers,O. Y1 .....6.25
Trenton,N.J. A7 .....6.55
Waukegan,Ill. A7 .....6.25
Worcester A7, T6, W12..6.55
Worcester,Mass. J4 ....6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....5.90
Alton,Ill.(1) L1 .....5.90
Buffalo W12 .....5.90
Cleveland A7 .....5.90
Donora,Pa. A7 .....5.90
Duluth A7 .....5.90
Johnstown,Pa. B2 .....5.90
LosAngeles B3 .....6.85
Monessen,Pa. P7, P16 ..5.90
NewHaven,Conn. A7 ....6.20
Palmer,Mass. W12 .....6.20
Pittsburg,Calif. C11 ....6.85
Portsmouth,O. P12 .....5.90
Roebling,N.J. R5 .....6.20
So.Chicago,Ill. R2 .....5.90
So.SanFrancisco C10 ....6.85
SparrowsPoint,Md. B2 ..6.00
Torrance,Calif. C11 ....6.85
Trenton,N.J. A7 .....6.20
Waukegan,Ill. A7 .....5.90
Worcester,Mass. A7 .....6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2 ...126
Ala.City,Ala.,17-18ga.R2 213
Aliquippa,Pa.9-14½ga.J5 130
Atlanta A11 133
Bartonville,Ill.(19) K4 ...130
Crawfordsville,Ind. M8 ..132
Donora,Pa. A7 130
Duluth A7 130
Fairfield,Ala. T2 130
Houston,Tex. S5 133
Johnstown,Pa. B2 130
Johnstown,17ga.,6" B2 ..204
Johnstown,17ga.,4" B2 ..207
Joliet,Ill. A7 130
KansasCity,Mo. S5 142
Kokomo,Ind. C16 132
Minnequa,Colo. C10 138
Monessen,Pa. P7 135
Pittsburg,Calif. C11 153
Portsmouth,O.(18) P12 ..137
Rankin,Pa. A7 130
So.Chicago,Ill. R2 126
Sterling,Ill.(1) N15 130

FENCE POSTS

ChicagoHts.,Ill. C2 140
Duluth A7 125
Franklin,Pa. F5 140
Huntington,W.Va. W7 ...140
Johnstown,Pa. B2 140
Marion,O. P11 140
Minnequa,Colo. C10 130
Moline,Ill. R2 136
So.Chicago R2 140
Tonawanda B12 140
Williamsport,Pa. S19 ...150

WIRE, Barbed	Col.
AlabamaCity,Ala. R2 136	
Aliquippa,Pa. J5 140	
Atlanta A11 143	
Bartonville,Ill.(19) K4 ..143	
Crawfordsville M8 145	
Donora,Pa. A7 140	
Duluth,Minn. A7 140	
Fairfield,Ala. T2 140	
Houston,Tex. S5 148	
Johnstown,Pa. B2 140	
Joliet,Ill. A7 140	
KansasCity,Mo. S5 152	
Kokomo,Ind. C16 142	
Minnequa,Colo. C10 146	
Monessen,Pa. P7 145	
Pittsburg,Calif. C11 160	
Portsmouth,O.(18) P12 ..147	
Rankin,Pa. A7 140	
So.Chicago,Ill. R2 136	
So.SanFran.,Calif. C10 ..160	
SparrowsPoint,Md. B2 ..142	
Sterling,Ill.(1) N15 140	

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2 123	
Atlanta A11 126	
Bartonville,Ill.(19) K4 ..123	
Crawfordsville M8 132	
Donora,Pa. A7 123	
Duluth,Minn. A7 123	
Fairfield,Ala. T2 123	
Joliet,Ill. A7 123	
KansasCity,Mo. S5 135	
Kokomo,Ind. C16 125	
Minnequa,Colo. C10 128	
Pittsburg,Calif. C11 147	
So.Chicago,Ill. R2 123	
So.SanFran.,Calif. C10 ..147	
SparrowsPoint,Md. B2 ..125	
Sterling,Ill.(1) N15 123	

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2 ...6.10
Bartonville,Ill.(19) K4 ..5.95
Crawfordsville,Ind. M8 ..6.30
Donora,Pa. A7 .....5.95
Duluth,Minn. A7 .....5.95
Johnstown,Pa. B2 .....5.95
Joliet,Ill. A7 .....5.95
Kokomo,Ind. C16 .....6.05
Minnequa,Colo. C10 .....6.20
Pittsburg,Calif. C11 .....6.90
Portsmouth,O. P12 .....6.25
Rankin,Pa. A7 .....5.95
So.Chicago,Ill. R2 .....6.10
SparrowsPoint,Md. B2 ..6.05
Sterling,Ill.(1) N15 ....5.65
Worcester,Mass. A7 .....6.25

NAILS, Cut (100 lb keg)
To dealers (33)

Conshohocken,Pa. A3 ..$7.35
Wheeling,W.Va. W10 ...7.35

NAILS & STAPLES, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2 ...118	
Aliquippa,Pa. (13) J5 ...118	
Atlanta A11 121	
Bartonville,Ill.(19) K4 ..118	
Chicago,Ill. W13 118	
Cleveland A9 125	
Crawfordsville,Ind. M8 ..122	
Donora,Pa. A7 118	
Duluth,Minn. A7 118	
Fairfield,Ala. T2 118	
Galveston,Tex. D7 126	
Houston,Tex. S5 126	
Johnstown,Pa. B2 118	
Joliet,Ill. A7 118	
KansasCity,Mo. S5 130	
Kokomo,Ind. C16 120	
Minnequa,Colo. C10 123	
Monessen,Pa. P7 124	
Pittsburg,Calif. C11 137	
Portsmouth,O. P12 124	
Rankin,Pa. A7 118	
So.Chicago,Ill. R2 118	
SparrowsPoint,Md. B2 ..120	
Sterling,Ill.(1) N15 118	
Torrance,Calif. C11 138	
Worcester,Mass. A7 124	

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1..6.15
KansasCity,Mo. S5 .....6.40
Lebanon,Pa. B2 .....6.15
Minnequa,Colo. C10 .....6.15
Pittsburgh J5 .....6.15
Seattle B3 .....6.65
So.Chicago,Ill. R2 .....6.15
Struthers,O. Y1 .....6.15
Youngstown R2 .....6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5 .....9.85
Lebanon,Pa.(32) B2 ...9.85
Minnequa,Colo. C10 ....9.85
Pittsburgh O3, P14 .....9.85
Seattle B3 .....10.35

TIE PLATES

Fairfield,Ala. T2 .....4.50
Gary,Ind. U5 .....4.50
Ind.Harbor,Ind. I-2 ....4.50
Lackawanna,N.Y. B2 ...4.50
Minnequa,Colo. C10 ....4.50
Pittsburg,Calif. C11 ...4.65
Seattle B3 .....4.65
Steelton,Pa. B2 .....4.50
Torrance,Calif. C11 ....4.65

JOINT BARS

Bessemer,Pa. U5 .....4.70
Fairfield,Ala. T2 .....4.70
Ind.Harbor,Ind. I-2 ....4.70
Joliet,Ill. U5 .....4.70
Lackawanna,N.Y. B2 ...4.70
Minnequa,Colo. C10 ....4.70
Steelton,Pa. B2 .....4.70

AXLES

Ind.Harbor,Ind. S18 ....5.60
Johnstown,Pa. B2 .....5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7 ..	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...(16)	4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19 ...	...	...	...	4.75

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.,Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield, S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 YoungstownSheet&Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	23.00	13.5W,4Cr,3V	140.00
Extra Carbon	27.00	18W,4Cr,2V,9Co	217.50
Spec. Carbon	32.50	19W,4Cr,2V,7Co	217.50
Oil Hardening	35.00	18.25W,4.25Cr,1V,4.75Co	185.50
Cr. Hot Wrk	35.00	20.25W,4.25Cr,1.6V,12.25Co	323.00
Hi-Carbon-Cr	63.50	1.5W,4Cr,1V,8.5Mo	78.50
18W,4Cr,1V	123.50	6.4W,4.5Cr,1.9V,5Mo	87.00
18W,4Cr,2V	138.00	6W,4Cr,3V,6Mo	109.50

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, V3.

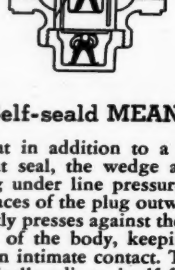
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

Homestead-Reiser
Self-Seald
LUBRICATED PLUG VALVES

The *Full-Port-Area* Valve built to outlast all other lubricated plug valves in the 200 pound working pressure class.

- 100% PORT AREA
- 100% LUBRICANT SEAL AROUND PORTS
- SELF-SEALING
- AUTOMATIC ADJUSTMENT FOR WEAR
- EXTREME ECONOMY OF LUBRICANT

Remains drop-tight for
Up to 22 TIMES
more operations
without Re-lubrication



Write today for Reference Book 39-Section 5.

Self-seald MEANS

. . . that in addition to a full-port lubricant seal, the wedge action of the plug under line pressure, forces the surfaces of the plug outward, and constantly presses against the seating surfaces of the body, keeping them always in intimate contact. The plug automatically adjusts itself for wear, assuring extra long life, maximum leakless service, and lubricant economy.

HOMESTEAD VALVE MANUFACTURING COMPANY

Serving since 1892

P. O. BOX 22 CORAOPOLIS, PA.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5	+3.5
¼	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0	+6.0
⅜	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	35.0	14.0	12.0	13.0
¾	11.5	1.18	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	23.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.5	23.0	21.5	22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5	22.5
2½	58.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill. (Gary base) L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 3½% on ⅛", plus 2½% on ¼", plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 16½% on 3½" and 4"; Youngstown Y1. Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. in.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base 10%	Both Sides	—Sheets— Carbon Base 10%	20%	Cu Base Both Sides
302	....	....	....	....	19.75	27.50	77.00
304	25.00	28.00–29.50	....	....	20.75–24.50	27.50	77.00
309	30.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	31.50–34.00	....	....	26.00	36.50	....
317	34.50	39.00	....	....	....	....	....
318	38.50	38.00	....	....	....	....	....
321	26.50	31.00	....	....	23.00	33.00	111.00
347	27.50	30.50–32.00	....	....	24.00	33.50	130.00
405	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	....
Nickel	33.25	44.25	41.00	54.00	....	....	....
Inconel	41.00	53.50	....	....	....	....	165.00
Monel	34.75	45.75	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4, stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ⅝-in. 18.5
- ¾-in. and larger 17.5

Longer than 6 in.:
- All diams. 14

Lag bolts, all diams.:
- 6 in. and shorter 23
- over 6 in. long 21

Ribbed Necked Carriage 18.5
Blank 34
Plow 34
Step, Elevator, Tap, and Sleigh Shoe 21
Tire bolts 12
Boiler & Fitting-Up bolts 31

NUTS

H.P. & C.P. Square:	Reg.	Heavy
½-in. & smaller	15	15
⅝-in. & ⅝-in.	12	6.5
¾-in.-1½-in.	9	1
1⅝-in. & larger	7.5	1
H.P. Hex:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	16.5	6.5
¾-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	23	17.5
¾-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS
American Standard
(Per cent off list for less than case or key quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ⅝-in.	29.5	22
¾-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
		Light
7/16-in. & smaller	35	
½-in. to ⅝-in.	28.5	
¾-in. to 1½-in.	26	

STEEL STOVE BOLTS
(F.o.b. plant; per cent off list in packages)
Plain finish .....48 & 10
Plated finishes ...31 & 10

HEXAGON CAP SCREWS
(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 42
- ¾-in. through 1 in. .. 34

Longer than 6 in.:
- ⅝-in. & smaller 26
- ¾-in. through 1 in. ... 4

SQUARE HEAD SET SCREWS
(Packaged; per cent off list)
1 in. diam. x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS
(Packaged; per cent off list)
No. 10 and smaller 35
¼-in. diam. & larger ... 16
N.F. thread, all diams. . 10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
7/16-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..List to list-plus-50c.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
4,5⅛	40	21.50
3	40	22.61
2½	24,30	23.15
2	24,30	25.36
CARBON		
40	100,110	8.03
35	100,110	8.03
30	84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03
14	60,72	8.57
10,12	60	8.84

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Baltimore, Types 301 through 347 sheet, except 303 and 309 E2.

Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Cleveland, strip A7.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all products, R2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25 on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303 & 309; 316 sheets 62.00c, strip 64.00c, W4.

Watervliet, N. Y., structurals & bars A4 quotes slight variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg...26.00-33.00
Industrial xylol ..25.00-33.50
Per ton bulk, ovens
Sulphate of ammonia..$32-$45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) ...17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron Cents
- 98+% Fe, carlots.. 16.00
- Swedish, c.i.f. New York, in bags ...7.40-8.50

Electrolytic Iron:
- Annealed, 99.5% Fe. 42.50
- Unannealed, 99 + % Fe 36.50
- Unannealed, 99 + % Fe (minus 325 mesh) 58.50

Powder Flakes 48.50
Carbonyl Iron:
- 97.9-99.8%, size 5 to 10 microns ...83.00-148.00

Aluminum:
- Carlots, freight allowed 29.50
- Atomized, 500 lb drums, freight allowed 33.50

Brass, 10-ton lots 30.00-33.25
Bronze, 10-ton lots 51.25-60.00
Phosphor-Copper, 10 tons 50.00
Copper:
- Electrolytic 43.25
- Reduced 33.75-37.00

Lead 25.50
Magnesium 75.00-85.00
Manganese:
- Minus 100-mesh 57.00
- Minus 35 mesh 52.00
- Minus 200 mesh 62.00

Nickel unannealed 83.00
Nickel-Silver, 10-ton lots 44.00
Silicon 38.50
Solder (plus cost of metal) 8.50
Stainless Steel, 302 .. 83.00
Zinc, 10-ton lots.23.00-30.50
Tungsten: Dollars
- 99%, minus 80 to 200 mesh, freight allowed: 1000 lb and over .. 4.00
- Less than 1000 lb .. 4.15

98.8% minus 65 mesh, freight allowed:
- 1000 lb and over ... 4.15
- Less than 1000 lb .. 4.25

Molybdenum:
- 99%, minus 80 to 200 mesh, over 500 lb 2.85
- 200 to 500 lb 3.10
- less than 200 lb .. 3.25

Chromium, electrolytic 99% Cr min. 3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll,fur. .$14.50-15.00
Connellsvll,fdry. .17.00-18.00
New River, foundry ...21.30
Wise county, foundry ..15.95
Wise county, furnace ..15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens.$22.75
Everett, Mass., ovens
- New England, del...*24.80

Chicago ovens 23.00
- Chicago, del. 24.40

Terre Haute, ovens 22.50
Milwaukee, ovens 23.75
Indianapolis, ovens ...22.75
- Chicago, del. 26.25
- Cincinnati, del 25.73
- Detroit, del. 26.71

Ironton, O., ovens 22.50
- Cincinnati, del. 25.12

Painesville, O., ovens..24.00
- Cleveland, del. 25.75

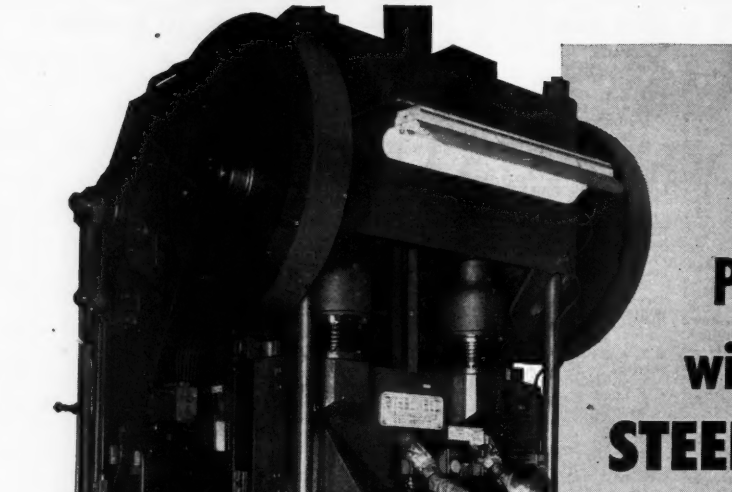
Erie, Pa., ovens 23.50
Birmingham, ovens ...20.30
- Birmingham, del. 21.69

Philadelphia, ovens ...22.70
Neville Island, Pa., ovens 23.00
Swedeland, Pa., ovens..22.60
St. Louis, ovens
- St. Louis, del. 25.40

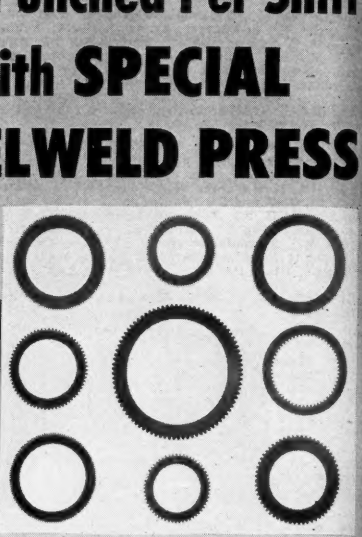
Portsmouth, O., oven..22.50
- Cincinnati, del. 25.12

Detroit, ovens 24.00
- Detroit, del. 25.00
- Buffalo, del. 26.75
- Flint, del. 26.49
- Pontiac, del. 25.42
- Saginaw, del. 26.81

* Or within $4.15 freight zone from works.



2,000 Clutch Plates Punched Per Shift with SPECIAL STEELWELD PRESS



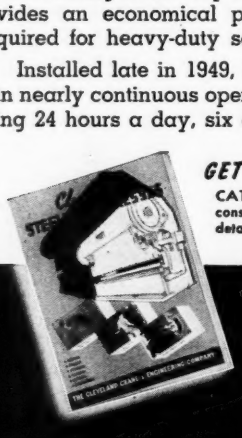
Punching gear teeth in clutch plates on Model K4-4 300-ton Steelweel Press.

Some of the many plates punched on the Steelweld Press, ranging from 11¾" to 22¾" diameter, all of .089 steel.

Versatility of the Steelweld Press design is convincingly demonstrated at the S. K. Wellman Co., Cleveland, where a machine, adapted for punching purposes, turns out 2,000 clutch gear rings per eight hour shift. Equipped with a specially wide bed and ram for accommodating the dies, and vertical tie rods at front for securing necessary rigidity, the design provides an economical press with stamina required for heavy-duty service.

Installed late in 1949, the machine has been in nearly continuous operation ever since, working 24 hours a day, six days a week. A large variety of clutch plates are punched. The largest is 22¾" O.D. of 13-gauge steel, with all teeth on the outside being punched at one stroke. The heaviest clutch plates punched are of 11-gauge steel. Multiple punching and notching are also done. The gear ring discs and washers are usually run through in lots of 4,000 to 25,000 at a time.

Because of satisfaction with this press, Wellman has purchased another larger Steelweld Press to help satisfy the growing demand for "Velvetouch" clutches, plates, facings and brake linings, used widely on tractors, trucks and heavy industrial equipment.



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THE CLEVELAND CRANE & ENGINEERING CO.

7835 East 281st Street • Wickliffe, Ohio.

STEELWELD

BENDING PRESSES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York (c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.15	6.28	7.74
Boston (city)	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try)	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city)	6.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)	5.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city)	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try)	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va.	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va.	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse)	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††[5]	6.00	6.25	7.56
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††[5]	5.80	6.05	7.35
Pitts. (w'hse)	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w'hse)	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city)	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse)	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City (city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity (w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city)	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm (w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05[2]	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse)	6.35	7.90	8.85[2]	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco	6.65	7.80[4]	8.90[3]	6.60	...	6.45	8.20	...	6.45	6.50	8.60
Seattle-Tacoma	7.05	8.60[3]	9.20[3]	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded; ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Indian manganese, 46-48%, nearby, 92.00-96.00c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr. c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%.) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 23.25c per lb of contained Cr. C.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 21.90c per pound of contained chromium. plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum, 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Fe) Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium ton lot $1.10, less ton $1.12. Delivered. Spot add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.00c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

Note: Current prices on zirconium, calcium and briquetted alloys appeared on page 141, July 16 issue; manganese, titanium and "other" ferroalloys, page 115, July 23. Refractories prices were published on page 141, July 16.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.65c, less ton 20.7c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.65c, smaller lots 12.15c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $3.10 per lb of contained V. Delivered, Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max., C 0.20% max.) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 63c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%). 10,000 lb W or more, $5.00 per lb of contained W 2000 lb W to 10,000 lb W, $5.10; less than 2000 lb W, $5.22.

Tungsten Powder: Carbon Reduced; (W 96.8% min.) 1000 lb or more, $6.00 per lb of contained W; less than 1000 lb W, $6.15.

*Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Apr. 19, 1951

STEELMAKING SCRAP COMPOSITE

July 26	$44.00
July 19	44.00
June 1951	44.00
July 1950	37.04
July 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

No. 1 Heavy Melting Steel (Grade) 1

Basing Point	Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 2 Heavy Melting	—$2.00
3. No. 1 Busheling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	— 3.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	+ 2.00
21. 1 foot and under	+ 4.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.
(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.
(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.
(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.
(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.
(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.
(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy melting Steel	—$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under.	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.
(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.
(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery.	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 3 cast iron.
(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 1, No. 2 or No. 3, $8.
(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3.
(4) For preparing into Grade No. 25, $6.
(5) For preparing into Grade No. 19, $6.
(6) For preparing into Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) For preparing into Grade No. 17 or Grade No. 21, $11.
(8) For preparing into Grade No. 18 or Grade No. 20, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.
(3) For preparing into Grade No. 16, $4.
(4) For preparing into Grade No. 17, $5.
(5) For preparing into Grade No. 18, $7.
(6) For preparing into Grade No. 21, $4.
(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commissions shall be payable to a broker in excess of $1.

Unprepared Scrap

For unprepared scrap, other than materials suitable for hydraulic compression, ceiling basing point prices shall be $8 per ton beneath ceiling of the prepared base grades.

For unprepared material which when compressed constitutes No. 1 bundles, ceiling basing point price shall be $6 per ton beneath ceiling for No. 1 bundles; or when compressed constitutes No. 2 bundles ceiling basing point price shall be $8 beneath ceiling basing point price for No. 2 bundles.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.
Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 83c; Butler, Pa., 65c.
Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.
Coatesville, Pa., 50c; Conshohocken, Pa., 20c.
Detroit, 95c; Duluth, Minn., 50c.
Harrisburg, Pa., 51c; Houston, Tex., 57c.
Johnstown, Pa., 75c.
Kansas City, Mo., 78c; Kokomo, Ind., 51c.
Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.
Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.
St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c.
Warren, Pa., 75c; Weirton, W. Va., 70c.
Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt.	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	34.00
Mechanical Bundles	33.00
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	28.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory, prep'd.	33.00
Bushelings new factory, unprep'd	28.00
Short Steel Turnings	28.00
Cast Iron Grades*	
No. 1 Machinery Cast.	58.00-60.00

* F.o.b. shipping point.

For High Density Bales... Use Self-Contained

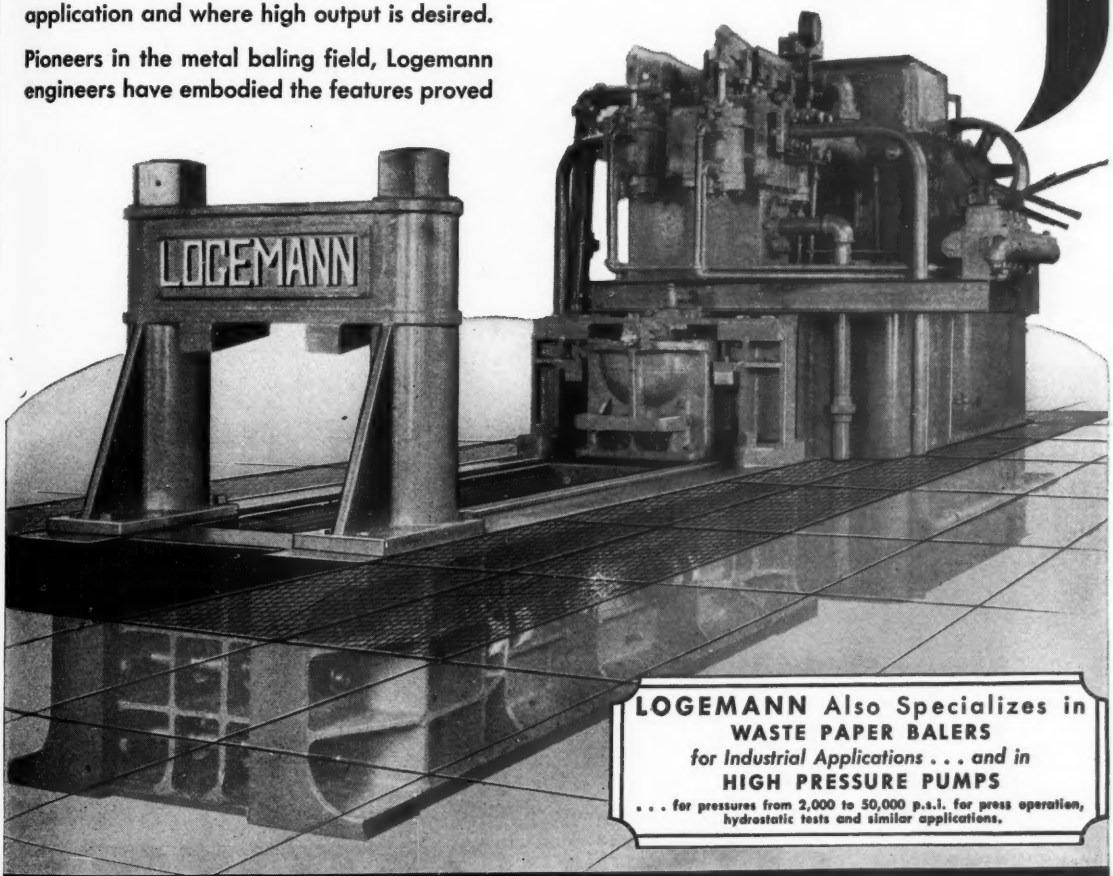
LOGEMANN Scrap Presses

Press, Pump, Tank... All in One Compact Assembly

Where space is limited, plants and mills can conserve floor space and piping, and at the same time handle high tonnages at low operating cost with a Logemann Scrap Press.

Both two and three ram models are available with automatic controls and are recommended when the nature of the scrap warrants such application and where high output is desired.

Pioneers in the metal baling field, Logemann engineers have embodied the features proved through actual operation to be essential to constant, uninterrupted service. Logemann engineers are prepared to offer suggestions as to operating layout and installation of any unusual or specific need. Present your problem to them, stating the nature of your scrap and the tonnage desired. There is no obligation.



LOGEMANN Also Specializes in
WASTE PAPER BALERS
for Industrial Applications . . . and in
HIGH PRESSURE PUMPS
. . . for pressures from 2,000 to 50,000 p.s.i. for press operation, hydrostatic tests and similar applications.

LOGEMANN BROTHERS CO.

3164 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

Perfect Performance depends on Craftsmanship...

The ultimate performance of any product depends on the knowledge and craftsmanship governing its manufacture. Washburn Craftsmen with their years of experience, plus modern equipment to control every production step, help to assure the quality of your product.

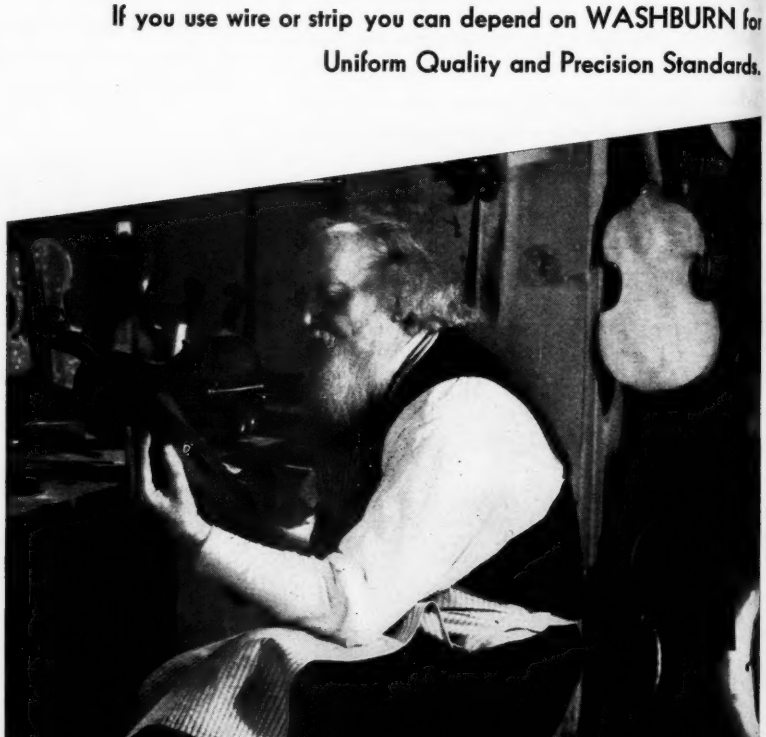
If you use wire or strip you can depend on WASHBURN for Uniform Quality and Precision Standards.

EAGLE Music Spring Wire

Round Untempered Low and High Carbon Spring Wires

Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish

Flat Tempered and Untempered Wires in .50 to 1.25 Carbon Range



WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

The Metal Market

Defense mobilization requirements stimulate production of critical metals. Mineral reserves being replenished for use in future years

PRODUCTION of most of the strategic and critical metals and minerals is increasing, says Oscar L. Chapman, secretary of the interior. The principal factor in this upward trend has been a sharp upswing in the average price of metals and minerals. Another has been a feeling on the part of industry that defense mobilization will provide a sustained market.

Activities of the Defense Minerals Administration in assisting mine operators to obtain necessary supplies and equipment for maintenance, repair and operation, contributed directly to the upsurge in mine production. Effect of its other programs, including accelerated tax amortization, loans, purchase contracts and exploration assistance, has not yet been felt directly. However, knowledge that they are being undertaken has contributed to the confidence in future prospects that has led to increased exploration and development work and the stepping up of production at operating properties.

Compared with the average monthly production rates for the first quarter of 1950, May saw the output of copper up 18 per cent, of zinc up 23 per cent. Lead is the only mineral on which the Bureau of Mines collects monthly data that showed a lower production in May than the monthly average for the first quarter of 1950, a decline of 6 per cent. This decline is partly attributable to a labor dispute.

One of the important effects of the DMA program will be the replenishment of mineral reserves for future years. As a result of exploration projects carried on with government assistance, the balance between production and known reserves, which is being dangerously upset by current heavy demands, may be restored, Mr. Chapman says.

Foreign Copper Price Rises

Ceiling price on copper refined from foreign ores was raised 3 cents a pound by OPS last week. This will allow custom refiners of foreign ores to reflect in their own prices the 3-cent a pound boost recently granted to Chilean copper interests by this government. It will release substantial tonnages of foreign ore which had been withheld from the market pending an official ruling on prices. Price of copper produced from domestic ores remains at 24.50c a pound.

Reopens Cuban Nickel Plant

National Lead Co., New York, acquired a substantial interest in Nickel Processing Corp., which will operate the former Nicaro Nickel Co. property in Cuba. The mine and reduction plant will be operated under contract with General Services Administration, Washington. Sharing ownership of Nickel Processing Corp. are Tin Processing Corp., controlled by the Billiton interests, and Cuban nationals. The $32 million plant was built with Defense Plant Corp. funds in 1942 to relieve a critical shortage of nickel. Deposits, while ample, were low-grade, causing a suspension of operations in March, 1947. Rehabilitation work is under way.

Aluminum Output Rising

Contract for electrical apparatus to be installed in the new aluminum production plant being erected at Wenatchee, Wash., by Aluminum Co. of America was awarded to Westinghouse Electric Corp., Pittsburgh. The contract, in excess of $3 million, provides for 24 ignitron rectifiers as well as transformers and other auxiliary equipment.

The $50 million plant being erected by Alcoa at Wenatchee will be capable of producing some 85,000 tons of aluminum annually.

In his midyear economic report to Congress, President Truman said the government's production goal includes a doubling of the 1950 aluminum output by 1953. Output of primary aluminum in 1950 totaled 718,622 tons.

National Association of Aluminum Distributors was organized to deal with the problems arising out of the phenomenally rapid growth of the aluminum industry which started just after World War II and shows no signs of a let-up. Officers of the trade group are: Harry L. Edgcomb Jr., Edgcomb Steel Corp., Hillside, N. J., president; W. W. Doxey, T. E. Conklin Brass & Copper Co., New York, vice president; T. Stenson White, Nottingham Steel Co., Cleveland, vice president, Ralph W. Shaw Jr., A. R. Purdy Co., Lyndhurst, N. J., treasurer.

Raymond L. Collier, for the last 22 years connected with the iron and steel foundry trade associations, was appointed executive secretary.

RFC May Reduce Tin Price

Reconstruction Finance Corp. is considering another reduction in the price of tin it sells to United States industry. This was revealed by W. Stuart Symington, administrator of this government agency. He told a Senate armed services group that this country is in such a "good" tin position that RFC, the sole importer of the metal, could stop buying for a while in the world market.

NPA Rules on Zinc Shipments

Slab zinc producers are permitted to ship to their regular customers up to one-half of the amount of the same grade slab zinc which was shipped to them in July. Permission to ship in advance of issuance of August allocations was granted because of the delay in mailing notices of allocation. Any excess shipments made under this authorization will show up in the inventories of slab users and corrections will be made in subsequent allotments.

TEN-TON CASTING: About 28,000 pounds of Navy M composition (88 per cent copper, 6 tin, 4½ zinc and 1½ lead) were poured to produce this casting at the Eddystone, Pa., plant of Baldwin-Lima-Hamilton Corp. After removal of gates and risers, shipping weight was about 20,000 pounds. Almost 30,000 pounds of metal were melted for the casting in an oil-fired reverberatory furnace with a 55,000-pound capacity

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c. Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 44.50c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.85c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb. c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 106.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, large lots, New York, $208-$213 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; effective May 23, 1951)

Sheet: Copper 40.18; yellow brass 37.28; commercial bronze, 95% 40.18; 90% 39.78; red brass, 85% 38.86; 80% 38.47; best quality, 38.07; nickel silver, 18%, 50.99; phosphor-bronze grade A, 5%, 59.42.

Rod: Copper, hot-rolled 36.03; cold-drawn 37.28; yellow brass free cutting, 31.70; commercial bronze, 95%, 39.87; 90%, 39.47; red brass 85%, 38.55; 80%, 38.16.

Seamless Tubing: Copper 40.22; yellow brass 40.29; commercial bronze, 90%, 42.44; red brass, 85% 41.77.

Wire: Yellow brass 37.57; commercial bronze, 95%, 40.47; 90%, 40.07; red brass, 85%, 39.15; 80%, 38.76; best quality brass, 38.36.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.295; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 30.10, l.c.l. 30.18, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	——Hexagonal—— 17S-T4
0.125	52.0	....	....
0.156-0.188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 37.69c; oval 37.19c. Cast 37.375c, delivered in eastern territory.

Copper Cyanide: 70-71% Cu, 100-lb drums 1000 lb 60.8c, under 1000 lb 62.8c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98% ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,900 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 29.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 68.50c; 10,000 to 30,000 lb, 69.50c; 3000 to 10,000 lb, 70.50c. 500 to 3000 lb 71.50c; 100 to 500 lb, 73.50c; under 100 lb, 76.50c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 35.00c; 400-lb bbl. 33.00c; up to 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels or 4 or more kegs.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 79.20c; 100 or 350 lb drums only, 100 to 600 lb, 64.50c; 700 to 1900 lb, 62.00c; 2000 to 9900 lb, 60.20c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. bronze, A	27.00	26.75	25.75

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 19.50; No. 1 composition borings 19.25 per lb of Cu content plus 83 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 78 cents per lb of tin content; unlined red car boxes 19.25; lined red car boxes 18.25; cocks and faucets 16.75; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross, 12.25c; new clippings and trimmings, 14.50; engravers' and lithographers' plates, 14.50c; die cast slabs, min. 90% zinc, 12.25; old zinc scrap, 11.25c; forming and stamping dies, 11.25; new die cast scrap, 10.75; old zinc die cast radiator grills, 10.50; old die cast scrap, 9.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 17.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb. Used storage batteries (in boxes) drained of liquid, 6.60c for 15,000 lb or more; 6.40c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 15.25c per lb. In addition, brokerage commissions are permitted.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00 dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July 2-26	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June 28-30	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June 18-27	24.50	16.80	17.50	106.00	19.00	42.00	56.50	87.75
June 15-16	24.50	16.80	17.50	111.00	19.00	42.00	56.50	87.75
June 14	24.50	16.80	17.50	118.00	19.00	42.00	56.50	87.75
June 13	24.50	16.80	17.50	123.00	19.00	42.00	56.60	87.75
June 8-12	24.50	16.80	17.50	129.00	19.00	42.00	56.50	87.75
June 7	24.50	16.80	17.50	136.00	19.00	42.00	56.50	87.75
June 1-6	24.50	16.80	17.50	136.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	50.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Sheets, Strip . . .

Sheet and Strip Prices, Page 109 & 110

Cleveland—So much tonnage is being certified to the mills under CMP trade hopes for an easing in the supply stringency are rapidly fading. Indications are there will be a large carryover of certified tonnage into fourth quarter which, when revalidated, will necessitate rejuggling mill schedules for the last three months of the year. As things now stand, it looks as though the "free" tonnage after defense needs are cared for will be very small. Meanwhile, some easing of demand pressure is noted from certain directions. For example, stampers serving the automotive industry are not pressing for tonnage like they were some time back, reflecting the cutback in production in that industry.

Cincinnati—Orders for sheets are flooding district mills. CMP volume may be found to exceed mill allocations.

Boston—Late processing of heavy allotments under CMP with abbreviated lead-time looms for the final quarter along with complications stemming from mountains of paper work. Many CMP inquiries for this quarter have been returned to customers due to lack of mill space.

New York—Most sellers are already booked up on hot and cold-rolled sheets for October, not including many orders that clerical forces are still processing. Surprise is expressed over a spurt in rated orders for cold rolled steel. Apparently Washington has been issuing tickets liberally for this material and consumers are wasting no time getting orders scheduled.

Mills report many requests for tonnage from other than regular customers, and there is nothing they can do but accept them provided they have tonnage left within the limits of their prescribed set-asides. In various instances, too, sellers believe CMP certificates call for more tonnage than consumers actually require.

Philadelphia—Galvanized sheet supply appears completely sold out for the final quarter. One large producer is sold up for the period on hot sheets, and is almost out of the market on cold sheets. Many buyers have placed orders up to 70 per cent of current quarter allotments.

Pittsburgh—Consumer estimates of sheet needs for third quarter were in excess of the tonnage actually required. Over-allocation is a serious problem. Fourth quarter tonnage is about fully booked for most mills. Despite 70 per cent reduction on third quarter estimates for fourth quarter delivery there appears to be over-allocation. This will result in heavy carryover at most mills. Obvious result is decreased tonnage for non-rated users.

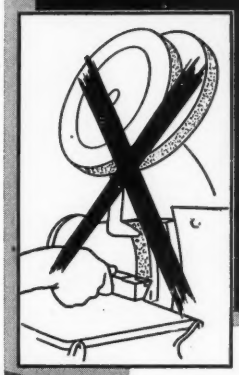
Los Angeles — Fabricators' third quarter flat-rolled steel receipts, in some cases, will be 35 per cent less than requirements.

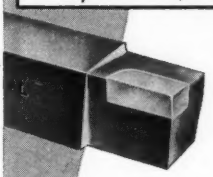
Wire . . .

Wire Prices, Page 111

New York—Some wire sellers report the slight cutback in automotive demand is not as large as they had

How to CONSERVE Grinding Wheels and Operator Time





Conservation of materials and manpower, always essential, becomes imperative in times of emergency.

Marked savings in equipment and labor required for maintenance operations are readily effected by using metal-cutting tools that stay sharp longer. The full significance of this obvious fact is perhaps not fully realized.

Kennametal tools, for example, work more hours per day, spend less time in the grinding room, and thus help sustain machine productivity, make operators more efficient, and reduce inventory. On important jobs they have demonstrated an ability to do up to four times as much machining per unit of carbide consumed.

This superior performance results from a unique coordination of manufacture and an all-inclusive control of properties—from raw materials to finished product.

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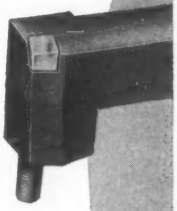

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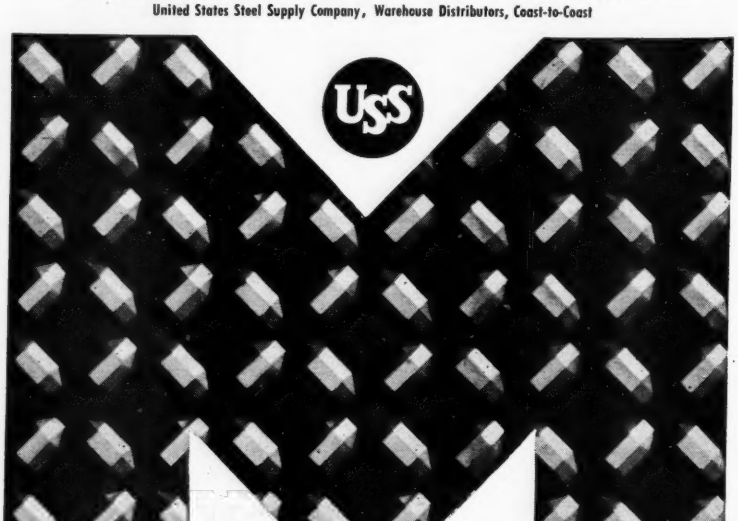


U·S·S MULTIGRIP FLOOR PLATE 1-973

UNITED STATES STEEL

anticipated. Expectation is cutbacks will be heavier as production limitations have more telling effect. In general, demand is strong, with wire producers receiving substantial tonnages for fourth quarter shipment.

Chicago—Demand for nails exceeds supply. Requirements for barbed wire are strong. Jobbers and mills are receiving emergency calls for both barbed wire and fencing from the Missouri-Kansas flood area.

Plates . . .

Plate Prices, Page 109

Philadelphia—One leading plate producer is booked through December on sheared plate, but has capacity left for November and December on universal and strip plate. According to government sources, demand for more than 3 million tons for fourth quarter will exceed supply by close to 600,000 tons.

Boston—Although plate mills are booked through fourth quarter with directive or potential controlled volume, consumers are still trying to place orders for September delivery.

Pittsburgh — Producers continually turn away orders for plates. Fabricators apparently expect the mills to find loopholes in the directive system. If you don't have a certificate you don't get plates. Demand runs high for both light and heavy plates with no civilian production available in September and outlook for fourth quarter equally dim.

Steel Bars . . .

Bar Prices, Page 109

Pittsburgh—Bars remain in most critical supply in this area. Hot-rolled will go to defense at a rate of about 90 per cent of mill output, far over the NPA specified minimum of 78 per cent for September. Word on cold-finished sets September minimum at 75 per cent with hot-rolled alloy bars, including projectile and shell quality, at 85 per cent and cold-finished alloy bars at 75 per cent of production.

New York—CMP orders for carbon bars are being received by the mills at a rate which has already well taken up a substantial part of fourth quarter capacity. On some smaller sizes producers haven't any tonnage available for shipment before late November. There are still a number of orders being processed by clerical staffs which will account for further extension of promises. It is believed there are far more CMP tickets than there is available supply.

Boston—Limited open volume of hot-rolled carbon bars for October may be reduced when fourth quarter allotments show up in orders. Alloys are tight. Even with melt sheets approved after frequent adjustments, producers are hampered by lack of alloying elements.

Philadelphia—On some of the smaller sizes of bars, as well as on some of the larger shell sizes, producers are practically booked up for the remainder of the year.

Cleveland—Supply stringency in bars is worse than ever with the mills being flooded with CMP certificates far exceeding not only their mandatory set-aside tonnage, but their capacity as well. Numerous orders

are being turned away by the mills. Until such time as CMP certificates are more closely aligned with anticipated production there is little likelihood of anything approaching order being re-established in this market.

Chicago—Most mills have fairly well scheduled their October production schedules despite the fact 45 days lead-time is two weeks away. It was possible to do this because requested tonnage considerably exceeds set-asides for rated use. Substantial amounts will have to be turned back.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 109

Los Angeles—Inability to get steel coupled with higher construction costs, up 240 per cent since 1940, is hampering fabricators in bidding on municipal and state government construction.

Tubular Goods . . .

Tubular Goods Prices, Page 113

Boston — Buttweld pipe stocks of distributors are building up but most sellers are over-committed on seamless. Numerous third quarter CMP orders have been moved into fourth quarter with buyers given seven days to revalidate. Most tubing specialties will be retained in September schedules but some merchant steel pipe volume may be pushed out.

Structural Shapes . . .

Structural Shape Prices, Page 109

Boston—Conversion of rated orders to CMP was too much for structural mills this quarter. No easing is in sight for fourth quarter with structural shop backlogs well extended. These will be subject to adjustments with direct defense construction getting first call. New bridge inquiry includes another section, Fall River, Mass., expressway. One 15,000 ton superstructure contract will be readvertised.

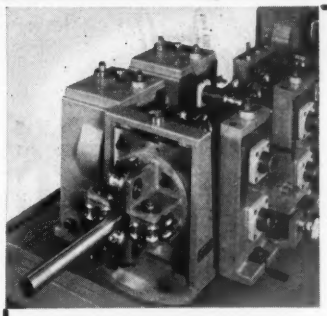
New York—Fabricated steel bookings in June, totaling 207,966 tons, dropped 22 per cent from the preceding month, but were 6 per cent greater than the same month for the average four years, 1947-1950. Bookings for first half of this year amounted to 1,728,794 tons, increase of 34 per cent over the corresponding 1950 period.

June shipments were 257,066 tons, highest for the year to date. Shipments for the first six months were 1,370,372 tons, increase of 28 per cent over last year.

Philadelphia—Fourth quarter shape tonnage is piling in on the mills rapidly. Practically all shape capacity for the quarter will be soon absorbed.

Pittsburgh—Fourth quarter structural bookings are just about complete. Supply outlook for non-rated users is bleak with an expected 98 per cent of September production going for defense. Industrial construction here is feeling the supply pinch.

Los Angeles—Heavy west coast construction, coupled with shortage of shapes, has boosted prices and lengthened delivery dates from premium-price sources.



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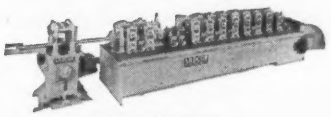

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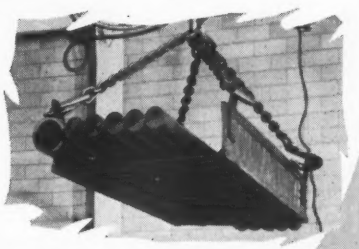

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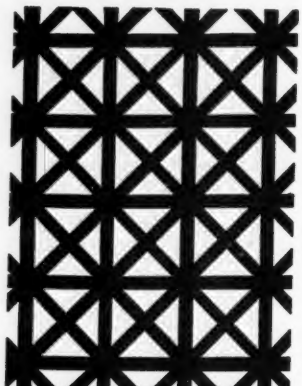

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Tool Steel Prices Advance

Washington — Ceiling prices advanced last week on high-speed tool steels, specialty steels containing tungsten, hard-facing products containing tungsten, and pure tungsten and thoriated tungsten products. OPS permitted manufacturers to recover part of the substantial increase in cost of raw materials going into these products.

Raw materials such as tungsten concentrates, ferrotungsten, and tungsten powder constitute one of the chief cost elements in the manufacture of these products, accounting for 15 to 60 per cent of their selling prices. Prices paid for these principal raw materials have increased from 45 to 120 per cent since the GCPR was issued Jan. 26.

Resellers covered by Supplementary Regulation 42 are permitted to adjust ceiling prices by the dollars-and-cents amount of the increase granted manufacturers. Price adjustments are made on the basis of GCPR prices plus applicable amounts set forth in SR 42. As an example, 1.50 cents for each 1 per cent of tungsten content for each pound of product may be added to the price of high speed tool steels and specialty steels containing tungsten; 2.05 cents for each 1 per cent of tungsten content for each pound of product may be added to the price of hard-facing products.

Tool Steel . . .

Tool Steel Prices, Page 111

Pittsburgh—Prices on high speed and tool steels containing tungsten were raised by Jessop Steel Co. and Firth Sterling Steel & Carbide Corp. last week in line with ceiling price supplementary regulation No. 42 allowing increases to offset higher cost of tungsten.

Regulation 42 permits raising prices 1½c per pound for each percentage point of tungsten over 1 per cent. This action increases price of standard tungsten-type high speed steel (18-4-1) 27c per pound and of molybdenum-type (6-6-2) 9½c per pound, 6-6-2 grade usually averaging 6¾ per cent tungsten.

Pig Iron . . .

Pig Iron Prices, Page 108

New York—Through continued liberal use of scrap, district foundries are able to make pig iron supply meet their more urgent requirements. Few melters have much, if any, iron inventory on hand despite the fact many arranged to take in shipments while closed for mass vacations. These suspensions came early in the month largely. The smaller of two blast furnaces at Swedeland, Pa., is expected to get back in operation within a week or so, but will have little foundry iron available in August due to the necessity of turning out basic for its affiliated steel mill at Conshohocken, Pa.

Boston—Pressure for iron has eased slightly, a decline in orders accompanying plant vacation closings. Exceptions are shops supplying machine tool castings. Total volume of defense work in this district is not much beyond 40 per cent.

Buffalo—Tightness continues to grip the merchant iron market. Only

a minor part of the total tonnage now produced by steelmakers is going into the merchant market. Motor and building equipment casters are taking large tonnages. Production holds at 100 per cent of capacity.

Philadelphia — Although domestic iron is in short supply, consumers are showing resistance to foreign offerings, and foreign prices appear softening a bit. One interest is asking $80 f.o.b. seaboard, but says it is willing to negotiate. Recently some 6000 tons were purchased by an eastern mill through a combination of barter arrangements which brought the price down to around $70, f.o.b. eastern seaboard.

Pittsburgh—Fifty-two of the district's 54 stacks are in blast as Crucible Steel Co.'s Midland plant put a repaired blast furnace back in operation late last week. Rated orders swamp the lone merchant producer here. U. S. Steel's No. 1 furnace at the Clairton Works was blown out for patching. It has an annual capacity of 321,100 net tons of iron.

Cleveland—Increasing pressure for pig iron on military and related defense account is anticipated. This, of course, means less tonnage will be available for normal merchant consumption. Adding to the bleak supply outlook, one stack of an important producer for the merchant market here is scheduled to go down for extensive repairs in September.

Chicago — Vacation closings of many foundries are temporarily relieving the strain on pig iron although allotments from sellers are being taken in during these down periods.

Los Angeles—Pig iron shortage is eased by improved receipts from the St. Louis area. Foundries' backlog of defense orders are higher by 50 per cent.

Scrap . . .

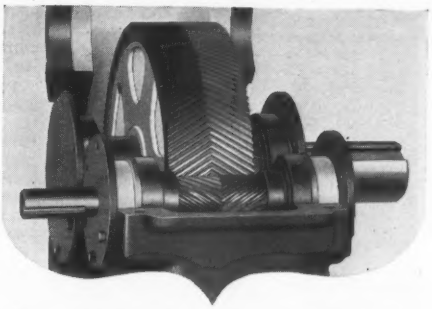
Scrap Prices, Page 116

Pittsburgh—Allocation of scrap in major industrial areas surrounding Pittsburgh hamper movement into the mills here. Generation of scrap has never matched consumption and the area must rely on outside shipments. Allocation of scrap produced here is prevalent; railroad scrap and major industrial scrap are allocated and there have been some instances of allocation of yard scrap.

Boston—Vacation suspensions at steel mills are over, and, while scrap was taken in during the interim, meager progress was made building inventories. The average is about three weeks. Allocations help some consumers but directives on yards are limited. Cast demand has ceased slightly with consumers more particular as to grading.

New York—Although steel scrap is as scarce as ever cast grades are relatively easy compared with a month ago. Expectation is there will be no real dearth of cast over coming weeks, unless further stringency in pig iron develops. Little improvement is expected in supply of steel grades before fall.

Buffalo—Reserve stockpiles of mills are slowly being rebuilt as sustained heavy volume of scrap is coming into the area from other points under allocations. Improvement is reported



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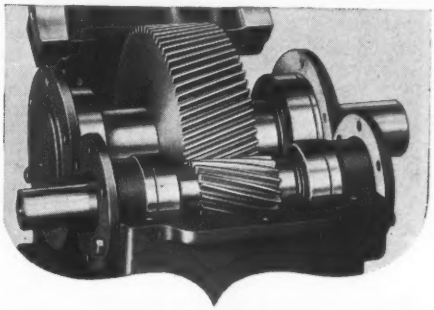

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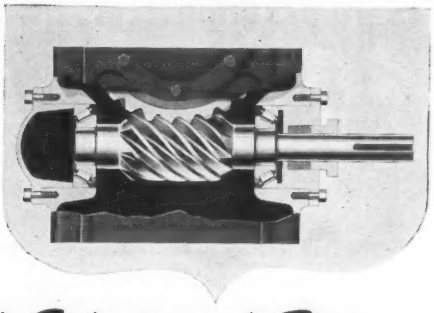

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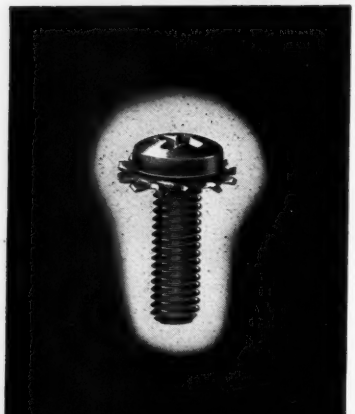

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also in collections at dealers' yards. Better quality scrap would be welcome. Rejections, however, are limited.

Philadelphia—Leading sellers of steel scrap believe July will mark the low point in scrap collections. However, supply is expected to remain tight indefinitely. Cast grades continue in better supply than steel scrap, although as more foundries get back into operation, following vacations, demand should stiffen shortly.

Midvale Co. is suspending for mass vacations during the first two full weeks in August and is holding up all raw material shipments, effective Aug. 4.

Cincinnati — Only through allocations are district steelmakers enabled to obtain adequate scrap iron and steel for current needs.

Detroit—Dealer scrap allocation in Detroit is believed a logical step to make sure mills get fair treatment. Electric furnace operators are seen in need of allocation help. The scrap drive is gathering a little momentum.

Chicago—Consumers are unable to improve inventories despite substantial receipts. Inventories at mills range from 6 to 14 days. Virtually all are receiving allocations. Some easing in demand for blast furnace grades is observed as a second of the district's 42 blast furnaces is scheduled to go down Aug. 1.

Vancouver, B. C.—In spite of embargoes on scrap, supplies are far below current demands. Every effort is being made to augment shipments and increase inventories. Buyers are combing every possible source. Consumers have extended their buying territory beyond Alberta into Saskatchewan in their scramble for material. East of this line, shipments move to Manitoba. One local firm is dismantling an old smelter at Anyox, B. C. from which 6000 tons will be obtained.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 113

Cleveland — Operations are off as much as 30 per cent at some industrial fastener plants. This partly reflects the usual summer slackening in activity including curtailments for vacations. But lack of steel is an important factor. Fastener producers have worked off most of their steel inventories and are virtually dependent on prompt mill shipments. These they are not receiving. One plant which ordinarily would consider a 10,000 ton inventory as low was down to a stock of 260 tons recently and expected little improvement soon.

Iron Ore . . .

Iron Ore Prices, Page 115

Cleveland—Shipments of Lake Superior iron ore increased to a record high for the season to date in the week ended July 23, amounting to 3,196,323 tons. Average daily loading rate was 445,319 tons from United States ports alone. This brought the season's cumulative total to 41,820,944 tons, increase of 36 per cent over that for the like 1950 period, according to Lake Superior Iron Ore Association.

Warehouse . . .

Warehouse Prices, Page 115

Cleveland—Demand pressure on the warehouses continues strong though some seasonal easing is noticeable. Vacation curtailments and slackening in the automotive industry are important influences affecting market activity at the moment. However, business volume of most distributors would be substantially larger were inventories adequate to fill all requests coming to them. Although the warehouses expect to get their full mill allotments up to 85 per cent of their receipts in the base period, indications are total warehouse receipts will be down from earlier in the year because of the drying up of "free" tonnage heretofore available in substantial quantities. With the mills virtually committed to capacity in the major products on CMP certificates, indications are the "free" tonnage in the market will be pitifully small.

New York—While July warehouse business is expected to be down somewhat from June, much depends on receipts from mills which are the real bottleneck. If it develops there has been a real spurt during the closing days of the month it is just possible business this month may be comparable with that in June. Over the past week or so there has been an improvement in mill receipts. Usually there is a marked jump in volume of incoming mill tonnage toward the close of the month. Mass vacations at various consuming plants have

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caused some restriction in demand, but even so inquiry is heavier than warehouses can supply with present inventories.

Boston—Most distributors are getting a substantial part of their carbon steel allocation. Demand is in excess of incoming volume and inventories are unbalanced. Tool steel stocks are more in line with demand, but overall stocks are about one-third normal.

Philadelphia—While mill shipments have been coming in at an appreciably faster pace, most warehouses estimate that July business will be off from the preceding month. Demand is less pressing because of mass vacations.

Pittsburgh—Little change is observed in high demand for distributor items here. Receipts are in line with NPA regulations but demand far exceeds supply.

Los Angeles—Purchases of warehouse steel by manufacturers of nondefense products are falling.

Warehouses Get Stainless

Washington — Steelmakers have been notified by telegram to set aside percentages of certain stainless steel and alloy steel products for warehouse and converter customers.

Up to this time the producers have been required to reserve only portions of their carbon steel output for these customers.

The set-asides are expressed as percentages of a steelmaker's average monthly shipments to converters and warehouses in the base period, Jan. 1 to Sept. 30, 1950. Converter set-asides are as follows: Stainless steel products, except tubing, with not less than 15 per cent in nickel grades, 85 per cent; stainless steel tubing with at least 80 per cent in nickel grades, 85 per cent; alloy cold-drawn bars with not less than 25 per cent in nickel grades, 100 per cent; all other alloy products with not less than 20 per cent in nickel grades, 100 per cent.

Set-asides for warehouses are: Stainless steel products, except tubing, with at least 15 per cent in nickel grades, 85 per cent; stainless tubing with 80 per cent in nickel grades, 85 per cent; commercial quality alloy steel in any grades containing specified percentages of nickel, molybdenum and chrome, 100 per cent.

Canada . . .

Toronto, Ont.—There is little prospect for any betterment in Canada's steel supply this year, Drummond, McCall & Co., steel warehouse operators, report. Every Canadian producer has a substantial expansion program under way but the added tonnage is not expected to ease the situation to any large extent.

Despite the fact that Canada's production and imports this year will reach 4,500,000 tons, an all time high, serious shortages continue.

Toronto, Ont.—Steel prices in Canada have been marked up $5 per net ton to make new prices at Hamilton as follows: Steel bars, base, $4.40; steel plates, $4.60; cold-rolled sheets, $5.30, and hot-rolled sheets, $4.35 per 100 pounds. No change was made in galvanized sheets which are quoted at $6.25 per 100 pounds.

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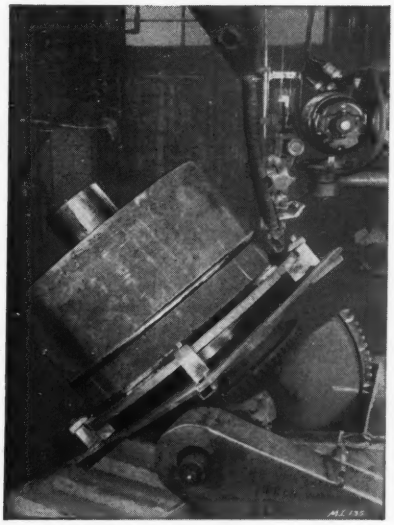

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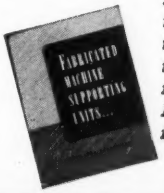

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500 tons or more, gate heads, stop logs and other equipment, Rock Island dam addition, to Consolidated Western Steel Corp., Seattle.

200 tons, library, Georgia School of Technology, Atlanta, to Bristol Steel & Iron Co., Bristol, Va.; J. A. Jones Construction Co., Atlanta, general contractor.

135 tons, school building, Quincy, Mass., to Grossier & Shlager Iron Works, Somerville, Mass.; S. & A. Allen Construction Co., Boston, general contractor.

100 tons plus, crest gates, latches and frames, Rock Island dam addition, to Moore Drydock Co., Oakland, Calif.

STRUCTURAL STEEL PENDING

15,000 tons, Boston connection, part one, superstructure, Central Artery, Boston; rejected, to be readvertised.

5000 tons, Du Pont nylon plant, near Pensacola, Fla.; bids closed July 25.

4500 tons, Forest Hills overpass, Roxbury district, Boston; bids Aug. 2, Metropolitan District Commission, Boston.

1600 tons, power station, Hartford, Conn., Electric Light Co.; Stone & Webster Engineering Corp., engineer-contractor.

800 tons, Mores Creek highway bridge, Boise county, Idaho, railroad relocation project Lucky Peak dam job; general contract to Roy L. Blair & Co., Spokane, Wash., by U. S. Engineer, Walla Walla, Wash.

245 tons, tower repairs, Delaware Memorial bridge, Wilmington, Del.; bids Aug. 9.

150 tons plus, reinforcing and steel piling also involved, railroad bridge and overpass, Wallula, Wash.; J. A. Terteling & Sons Inc., Boise, Idaho, low to U. S. engineer.

REINFORCING BARS . . .

REINFORCING BARS PLACED

565 tons, library, Georgia School of Technology, Atlanta, to Hall Steel Co., Atlanta; J. A. Jones Construction Co., Atlanta, general contractor.

350 tons, State Library of Hygiene, University of Wisconsin, Madison, Wis., to United States Steel Supply Co., Chicago.

350 tons, including 203 tons in storm sewer and 150 tons in pumping station, Congress street expressway, Chicago, to United States Steel Supply Co., Chicago; S. A. Healy Co., Chicago, contractor.

170 tons, research laboratory, building No. 330, Argonne National Laboratory, DuPage county, Illinois, to Bethlehem Steel Co.; S. N. Nielsen Co., Chicago, contractor.

149 tons, St. Francis Borgia school, Chicago, to Olney J. Dean Steel Co., Chicago; Montague Construction Co., Chicago, contractor.

55 tons, school building, Quincy, Mass., to Concrete Steel Co., Boston; S. & A. Allen Construction Co., Boston, general contractor.

REINFORCING BARS PENDING

2900 tons, jet engine plant, Buick Division, General Motors Corp., Willow Springs, Ill.

890 tons, substructure, Clinic building, Henry Ford hospital, Detroit.

635 tons, Southern Wisconsin Colony Training school, Union Grove, Wis.

600 tons, expansion, Solar Aircraft Co., Des Moines, Iowa.

600 tons, National Petro-Chemicals Corp., Tuscola, Ill.

395 tons, flood protection, Sec. 2, New Albany, Ind.

260 tons, Fenwick high school, Oak Park, Ill.

250 tons, 20-mile section, Potholes East canal, Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash., Aug. 8.

209 tons, including 180 tons of bars and 29 tons of joists, residence units, Mentally Sick Children, Institute for Juvenile Research, Chicago; bids of June 12 rejected.

185 tons, waterworks improvement, Evergreen Park, Ill.

150 tons, expansion, Whirlpool Corp., Laporte, Ind.

110 tons, Pittman Square school, Gary, Ind.

100 tons, Community hospital, Evanston, Ill.; Charles B. Johnson & Sons Inc., Chicago, contractor.

PLATES . . .

PLATES PENDING

Unstated tonnage, 150,000-gallon steel water storage tank, Orange Farm, Florida, N. Y.; Hammond Iron Works, Warren, Pa., low.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Canadian National Railways, three 1200 hp diesel-electric locomotives, to General Motors Ltd., London, Ont.; one 1000 hp deisel-electric switcher, to American Locomotive Co., New York.

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 200 seventy-ton tank cars, to unnamed builders.

Canadian National Railways, 4305 freight cars, divided between Canadian Car & Foundry Co., Eastern Car Co. and National Steel Car Co.

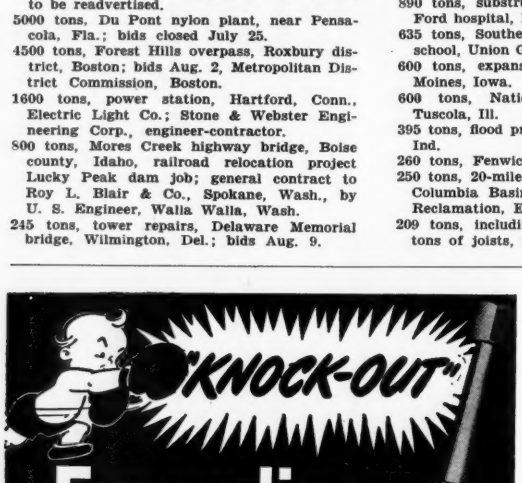
Chicago, Indianapolis & Louisville, 250 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Chicago & Northwestern, 250 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Delaware, Lackawanna & Western, 100 seventy-ton covered hopper cars, to American Car & Foundry Co., New York.

Grand Trunk Western, 250 fifty-ton box cars, to American Car & Foundry Co., New York, and 250 seventy-ton triple hopper cars, to General American Transportation Corp., Chicago.

Union Pacific, 100 steel caboose cars, to its Omaha, Nebr., shops.



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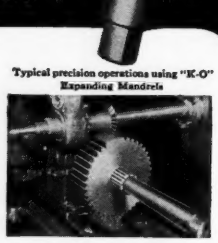

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Carboloy Offers New Line

A line of standardized twist drill tips for cast iron drilling is added to the line of blanks carried in stock by Carboloy Department, General Electric Co., Detroit. Decision to take this action reflects recent developments in the techniques of drilling cast iron with carbide tipped twist drills and the resultant increasing demand for such twist drills. Standard twist drill tips for drilling nonferrous materials are also carried in stock in 23 sizes.

Lewis Welding Buys Rights

Rights to exclusive sale and manufacture of MacRay 4-ounce plastic injection molding machine were purchased by Lewis Welding & Engineering Corp., Bedford, O. from MacRay Engineering Co., Cleveland.

Plans $500,000 Addition

Construction of a $500,000 addition to the plant of Electric Hose & Rubber Co., Wilmington, Del., has been started.

Swaging Services Offered

Hero Mfg. Co., Middleboro, Mass., manufacturer of knitting needles, made a change in their swaging department policy. All of their facilities for the precision high-speed swaging of metal rods and tubes are now available for any interested manufacturer.

Ohler Mfg. Co. Expands

Ohler Mfg. Co. Inc., Baltimore, is erecting an addition of several thousand square feet, doubling its present space. The company has secured some defense work. In addition to general machine shop work, it makes special tools and dies, machine parts and specializes in precision work.

Skirvin Moves to New Plant

Skirvin Tool & Engineering Co. Inc. moved to its new plant at 3448 Shelby St., Indianapolis.

Goodrich Expands Plant

Another major expansion of the Miami, Okla., tire and tube plant of B. F. Goodrich Co., the third since 1946, is announced by Walter E. Head, plant manager. Construction work will be undertaken as rapidly as building materials are available. The addition will add 60,000 square feet of manufacturing space and 50,000 square feet for storage and handling of raw materials and finished goods. With the latest addition, the plant will have nearly 1 million square feet of floor space and will produce about 500,000 pounds of finished goods daily.

Monsanto Awards Contracts

Monsanto Chemical Co., St. Louis, awarded contracts for the design and construction of a multimillion dollar elemental phosphorous plant in Soda Springs, Idaho, to H. K. Ferguson Co., Cleveland, and Morrison-Knudsen Co., Boise, Idaho. Purchase of materials and equipment will be handled by Ferguson.

Will Reopen Ilion Plants

Remington Arms Co. Inc., Bridgeport, Conn., will reopen three idle buildings at Ilion, N. Y., for production under a $4.5 million government contract to set up assembly lines for small arms parts.

Crane Packing to Build

Crane Packing Co., Chicago, will erect a $420,000 factory and office building in Morton Grove, Ill. The company manufactures packings, mechanical seals, precision lapping machines, pipe thread and gasket compounds.

Allis Chalmers Names Agents

Allis-Chalmers Mfg. Co., Milwaukee, appointed Tools & Supplies Inc., St. Louis, and Independent Distributing Co., St. Joseph, Mo., as distributors for its Texrope drive equipment.

John W. Metcalfe Co.

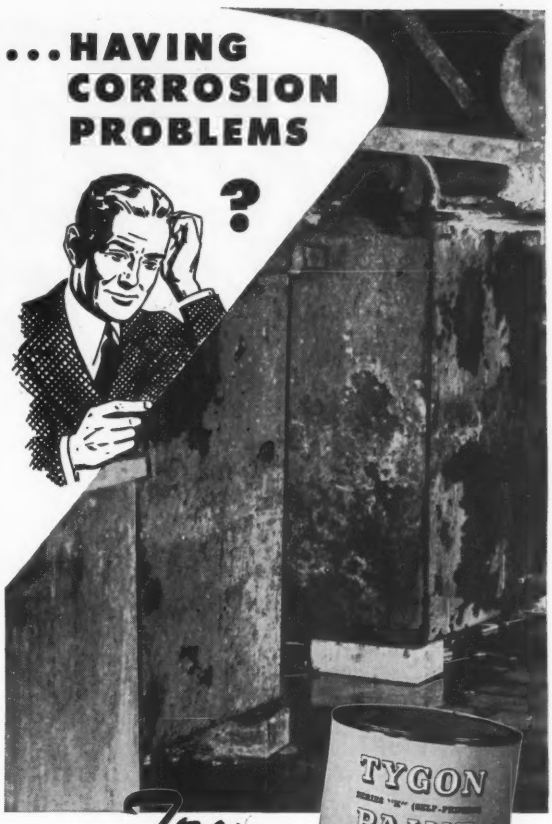
John W. Metcalfe, formerly associated with Bethlehem Steel Co. and more recently with Keystone Fabricating Co., organized the John W. Metcalfe Co., offering engineering drafting and structural steel detail drawings. Office and drafting rooms are located in the Bessemer Bldg., Pittsburgh.

Buys Steel Rolling Mill

Remington Rand Corp., Buffalo, purchased the R. W. Head Co. steel rolling mill in Ithaca, N. Y. It will roll special steel strips and shapes for the parent company.

Abrasive Firm Expands Plant

A $1.2 million expansion program by Bay State Abrasive Products Co., Westboro, Mass., was approved by NPA. Certificates of necessity have been issued and construction work started. Of the total, about $700,000 will be devoted to extension



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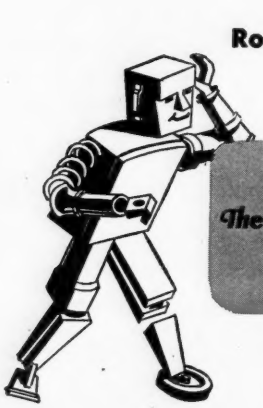

The Colorado Fuel and Iron Corporation

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AMERICAN WIRE FABRICS CORPORATION, Mt. Wolf, Pa.
CLAYMONT STEEL CORPORATION, Claymont, Del.
THE CALIFORNIA WIRE CLOTH CORPORATION, Oakland, Calif.
WICKWIRE SPENCER STEEL DIVISION, New York, N.Y.

of present factory and storage buildings. The balance is to be used to purchase new equipment, including a high-temperature tunnel kiln.

Builds Electroplating Unit

Western Electric Co., Baltimore, completed a new electroplating unit at its Point Breeze plant. Copper, tin, zinc or nickel finishes are applied to about 350 different piece parts having a total weight of 1,250,000 pounds per year, and varying in size from 6000 parts to the pound to items of 3.25 pounds each.

Babcock & Wilcox Co. Moves

Babcock & Wilcox Co.—steam generators and related equipment—leased five floors in the Chrysler Bldg. East, New York, totaling about 120,000 square feet. Sales offices of Babcock & Wilcox Tube Co., a subsidiary, presently located at 22 E. 40th St., New York, will also be moved into the Chrysler Bldg., East.

Toro Purchases Mooers Co.

Toro Mfg. Co., Minneapolis, purchased the plant and facilities of Mooers Co., Windom, Minn. Toro will transfer its manufacture of power mowers and machine tools from Minneapolis to Windom this fall.

Dunham Builds Shell Plant

C. A. Dunham Co., Chicago, is constructing an addition to its plant in Michigan City, Ind. This manufacturer of heating systems and equipment will use the new facilities to produce high explosive artillery shells for the military services on a $9 million defense contract.

Bids Low on Laboratory

S. N. Nielsen Co., Chicago, submitted the lowest bid, $1,049,000, for the construction of a research laboratory building in Lemont, Ill., for the United States Atomic Commission, Washington.

Appoints Venezuelan Agent

United States Air Conditioning Corp., Minneapolis, appointed P. C. Bousquet G. & Co. and Stolk & Bosquet, Caracas, Venezuela, as representatives and distributors of its air conditioning, heating and ventilating equipment in that country.

Buys Hardy Instrument Co.

International Resistance Co. purchased Hardy Instrument Co., Forest Hills, L. I., and Long Island City, N. Y. All operations of the company will be transferred to the Specialty Division, International Resistance Co., at 401 N. Broad St., Philadelphia. Norman Hardy, founder of the organization, joined the IRC staff as sales engineer while Benjamin Solow, chief engineer and associate of Mr. Hardy, is currently employed by IRC to continue development and product design on selenium rectifiers and their applications.

Burroughs Buys Firm

Burroughs Adding Machine Co., Detroit, purchased Control Instrument Co. Inc., Brooklyn, N. Y., designer and manufacturer of electronic instruments and fire control devices for the Navy. Control Instrument will continue, as a separate corporation, to use its facilities for defense production in this field. John J. Hyland will continue as president of the Brooklyn firm.

Plans $3 Million Plant

Vickers Inc., Detroit, will build a $3 million plant for the manufacture of hydraulic equipment in Joplin, Mo. The factory will contain 100,000 square feet of floor space.

Youngstown Awards Contra

Youngstown Sheet & Tube Co., Youngstown, awarded Salem Engineering Division of Salem-Brosius Inc. a contract for design and erection of a triple-fired pusher type slab heating furnace at the company's Indiana Harbor, Ind., Works. Erection is scheduled to get under way in the first quarter of 1952.

Cylinder Maker Builds Plant

Miller Motor Co., Chicago, manufacturer of air and hydraulic cylinders, built a plant with about 50,000 square feet of floor space at Melrose Park, Ill.

Thompson Trailer Expands

Thompson Trailer Corp., Pikesville, Md., awarded a contract for a 30,000 square foot addition which will double the company's floor space. Thompson manufactures aluminum commercial trailers; the expansion is in connection with aluminum fabrication for electronic parts.

Will Make Jet Engine Parts

Cockshutt Plow Co., Brantford, Ont., as licensee in Canada for the British firm of John Lucas & Co., will assume operation management of the Canadian government-owned plant at Renfrew to manufacture the combustion unit for the Orenda jet engine. It is expected the plant will be in operation next September. The government purchased the plant from Renfrew Machinery Co. several weeks ago and is making all capi-

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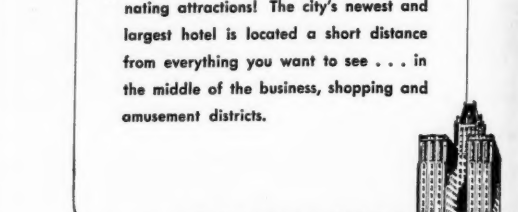

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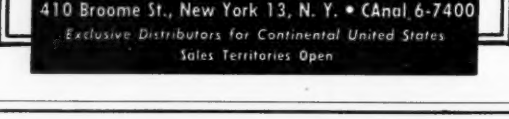

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WELDING FIXTURES ★ OFFSET & CONTOUR FORMERS

tal expenditures and holding full title to the plant and equipment. Cockshutt Co. will operate it on a straight management basis. The combustion or fuel systems for the jet engines are turned out as a unit, and already are being produced in Brantford.

Closes Sulphuric Acid Plant

E. I. du Pont de Nemours & Co., Wilmington, Del., closed its sulphuric acid plant at Niles, O., and plans to dismantle it. The shutdown is attributed to the shortage of sulphur and inability to operate the plant economically.

Press Manufacturer Expands

Clearing Machine Corp., Chicago, awarded the general contract for erection of a $350,000 factory building in Joliet, Ill., to Abell-Howe Co., Chicago. The company produces presses and pneumatic cushions for die presses.

Gregory Industries Inc.

Morton-Gregory Corp., Toledo, O., changed its name to Gregory Industries Inc. Principal interest of the corporation is the Nelson Stud Welding Division, Lorain, O., producer of fasteners and equipment.

Westinghouse Builds Plant

Construction of a plant near Madison, Ind., which will increase its headlight manufacturing facilities by 50 per cent, is planned by Westinghouse Electric Corp. Opening of the plant is scheduled tentatively for mid-1952.

Pump Maker Buys Factory

E. C. Brown Co., spray pump manufacturer, sold its building at 845 Maple St., Rochester, N. Y., to the Roseaf Corp., that city, for a reported price of $320,000. The Brown concern plans to relocate as soon as possible.

Tomke Aluminum Expands

Tomke Aluminum Division, United Iron & Metal Co. Inc., Baltimore—aluminum ingots, etc.—awarded a contract for an addition to its storage building. Jacob S. Shapiro is president.

Purchases Canadian Plant

Sterling Factories, Erie, Pa., purchased a plant in Fort Erie, Ont., which will provide Sterling with supplies of aluminum. While Canadian law forbids the export of raw aluminum sheets, it allows export of aluminum which has undergone some manufactured process. It is expected the Fort Erie plant will perform preliminary manufacturing operations on the aluminum and ship it to Erie to be finished.

Opens New England Office

Phelps Dodge Copper Products Corp., New York, established a New England sales office at 828 Statler Office Bldg., Boston. Craig W. Marshall, general accounts, and Frank A. Stevens Jr., utilities, will make their headquarters at this office. Warehouse facilities for the company will be continued at 143 Sidney St., Cambridge, Mass.

Ampco Appoints Distributor

Ampco Metal Inc., Milwaukee, appointed R. J. Greer Equipment Co., Syracuse, N. Y., as distributor for its line of resistance welding electrodes.

Plans $8 Million Plant

Facilities for production of graphite electrodes will be constructed by International Graphite & Electrode Corp., Niagara Falls, N. Y. Cost is estimated in excess of $8 million.

Will Make Tubing in Ohio

Superior Tube Co., Norristown, Pa., purchased a building containing 15,000 square feet of floor space in Wapakoneta, O. Operations in the plant are expected to start in December. Production will consist of seamless nickel cathodes for the electronics industry and stainless steel hypodermic needle tubing.

Atlas Builds Large Plant

Atlas Powder Co., Wilmington, Del., will build a $1,531,000 plant at Atlas Point, Md., for the manufacture of sorbitol.

Bacon Felt Completes Move

Bacon Felt Co. transferred all its activities to its new Taunton, Mass., factory where it recently moved from Winchester, Mass.

File Incorporation Papers

Charters of incorporation were filed with the secretary of state's office, Dover, Del., by: Metalweld Inc., with Corporation Service Co., Wilmington, serving as principal office; Federal Export & Import Co.—machinery and equipment—with Tax Research Bureau Inc., Wilmington, serving as principal office; National Resources Corp.—metals—with Registrar & Transfer Co., Dover, Del., serving as principal office; B. & G. Olsen Co. Inc.—machinery—with Corporation Trust Co., Wilmington, serving as the principal office; Research Development Manufacture Inc.—machinery—with Corporation Guarantee & Trust Co., Wilmington, serving as the principal office.

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100 pound
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3/16 x 1 1/8 R.H. Rivets (Approx. 322,500 pcs.) 3,707#
3/16 x 1 1/4 R.H. Rivets (Approx. 203,300 pcs.) 2,480#
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Will consider an offer for the entire lot or any portion of it. All offers will be given careful and prompt attention.
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Late Model Preferred. Please describe in detail, giving make, model, serial number and year of manufacture. Address Box 333, STEEL, Penton Bldg., Cleveland 13, O.

WHAT COULD BE SIMPLER?

Let us help you locate that machine or material which you need. A Wanted advertisement in this section will tell all our other readers of your requirements. Just write STEEL, Penton Bldg., Cleveland 13, outlining your needs and we will set up an attractive advertisement for you.

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Help Wanted

WANTED

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Must be thoroughly experienced, particularly in the production of ferrosilicon and ferrochrome. Excellent opportunity for a good reliable man. Please give complete record of experience and qualifications.

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Box 636 — Niagara Falls, N. Y.
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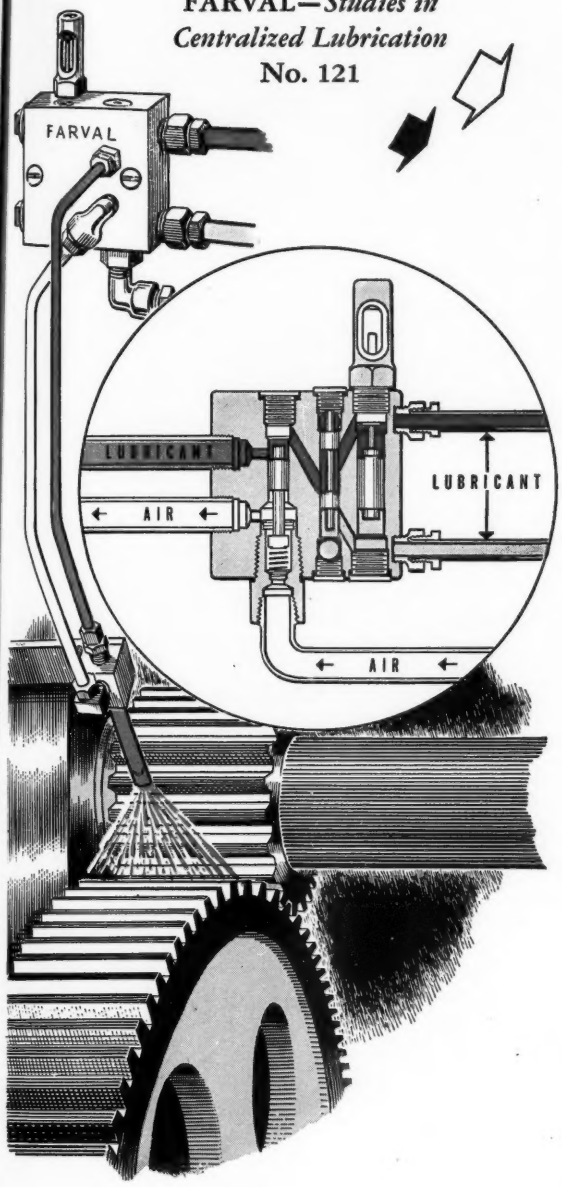


New Farval Spray Valve

meters lubricants to slide surfaces and open gearing

CONTROLLED spraying of lubricant on open gearing, slide surfaces, etc., is practical with the new Farval Spray Valve.

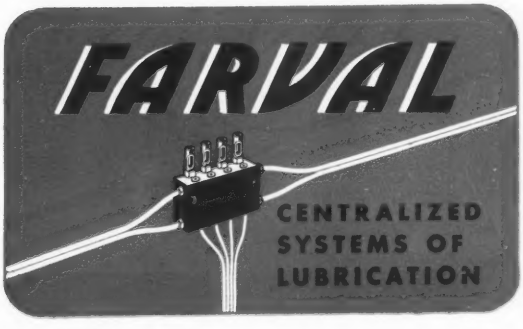
By an ingenious adaptation of the familiar Farval Dualine Valve, either grease or oil is sprayed through a nozzle—on any desired area, in any desired amount, and at any desired interval. The new spray valve can be added at any point in a regular Farval Dualine System where compressed air is available—or a complete system may consist entirely of spray valves, served by either manual or automatic pumping unit.

Compressed air from the supply line is directed through the spray valve, which meters air to the delivery nozzle just as lubricant is metered. By a unique arrangement, the lubricant valve also turns on and shuts off the air. Thus the quantity of air used is limited to the amount needed to spray each delivery of oil or grease, without exhausting or reducing pressure. Positive cut-off of lubricant by the Farval valve after each delivery eliminates bleeding from the nozzle—no waste, no mess, no trouble.

The Farval Spray Valve has been thoroughly tested in service and is now in use on a wide variety of machines and equipment. It has demonstrated its ability to supply lubricant efficiently and economically to open gearing, slide surfaces, in fact, wherever a standard Farval Dualine closed system is not readily adaptable.

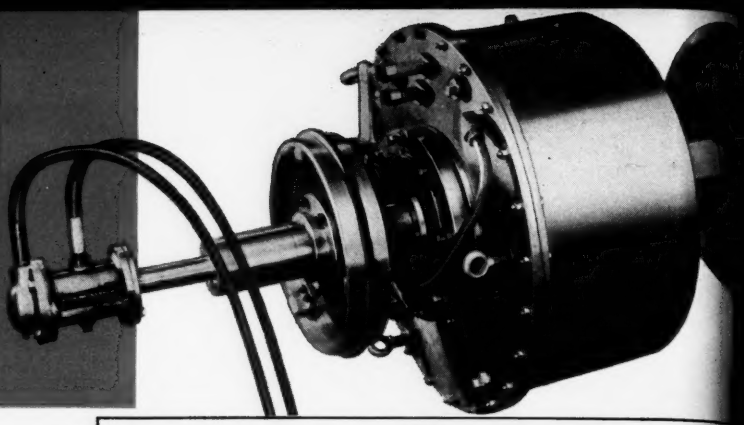
Write for a copy of Farval Spray Valve Bulletin No. 60 for a full description, with illustrative diagrams and installation data. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



THE LAST WORD IN TUBE MILL DESIGN

McKay Boosts Operating Efficiency and Reduces "Down Time" with New Forced Oil Cooled Rotary Transformer



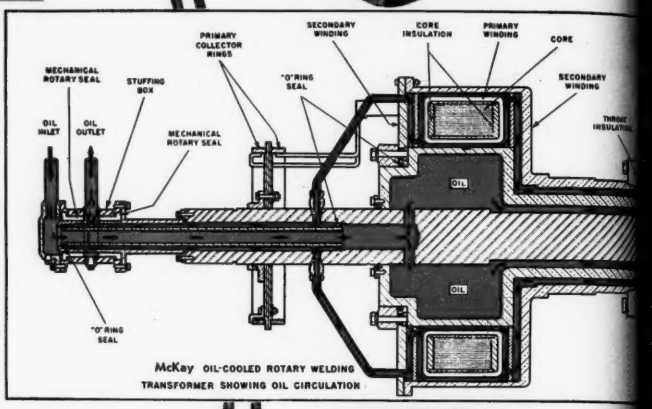
There has always been a demand for a trouble-free rotary transformer for resistance weld tube mills. McKay has recently acquired the exclusive right to design and manufacture the rotary transformer originally built under the Thomas M. Hunter Patents.

The **New Design** incorporates **Forced Oil Cooling** with the following advantages:

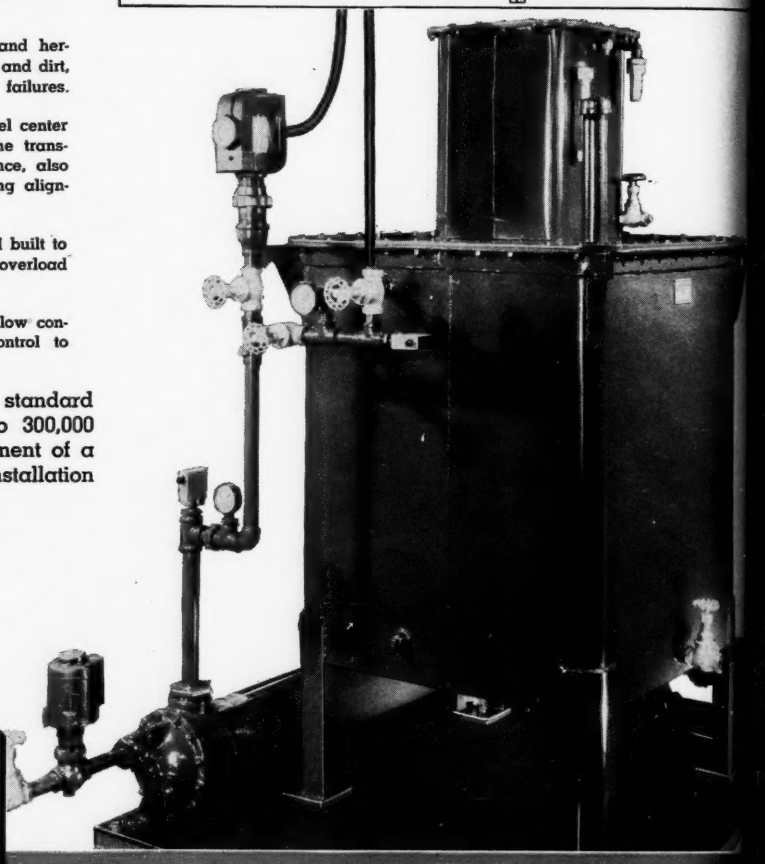
1. **Oil**, which is a non-conductor, is forced into direct contact with the high voltage primary and the inner and outer (copper) secondary castings — thereby removing heat at its source and increasing overall efficiency.
2. Entirely enclosed design of transformer and hermetically sealed oil tank exclude moisture and dirt, thereby eliminating the chief causes for failures.
3. Mechanical loads are all referred to a steel center shaft which extends the full length of the transformer, thereby maintaining perfect balance, also insuring maximum rigidity and maintaining alignment of electrodes.
4. Designed exclusively for tube mill use and built to operate at 100% duty cycle with generous overload capacity.
5. Automatic temperature control of oil and flow controls are interlocked with tube mill control to provide fool-proof operation.

The rotary transformer is built in several standard sizes covering a range from 22,000 to 300,000 amperes, and is available as a component of a complete tube mill or separately for installation in existing tube mills.

The rotary transformer and oil cooling system is completely covered by U. S. and Foreign Patents issued and pending.



McKay OIL-COOLED ROTARY WELDING TRANSFORMER SHOWING OIL CIRCULATION



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